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Components of Effective Teacher Induction Programs and the Impact of Experienced Mentors

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Abstract

Based on data from the 2007-08 Schools and Staffing Survey (SASS), 2008-09 Teacher Follow-up Survey (TFS) and 2009-10 Beginning Teacher Longitudinal Study (BTLS) datasets, this study examined a prediction model for new teacher retention that combined variables from both the presence of induction program components and mentoring traits. New teacher retention was selected as an important criterion because attrition causes a large financial burden on already budget-limited districts, and teacher turnover impacts teacher effectiveness and student learning. Results of a logistic regression analysis indicated that the presence of an induction program (W1T0220), the presence of a mentor (W2MNTYN), the use of seminars or classes for beginning teachers (W1T0223), and regular supportive communication with a principal or other administrator (W1T0225) during the first year of teaching were significant predictors for teacher retention in a sample of $N = 1992$ new teachers. Two-way frequencies revealed that new teachers who did not participate in an induction program left teaching in years two and three at nearly twice the rate of those who had induction. Similarly, teachers who had seminars or classes for beginning teachers and regular supportive communication with their principals, department chairs, or other administrators left teaching in years two and three at half the rate of those new teachers who did not have either of those induction components. Additionally, teachers who worked with a mentor during their first year of teaching left teaching in years two and three at half the rate of those teachers who did not have a mentor. Generalized induction programs utilizing each of the significant predictors are presented with the expectation that their use could decrease teacher attrition and result in greater overall teacher effectiveness and student learning.

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Chapter 1

Introduction

Introduction

The next time you are sitting on a plane getting ready to land in bad weather, ask yourself if you prefer a pilot with years of experience or one fresh out of flight school. Now imagine you are the parent of a school-age child. Would you prefer that they learn from a veteran teacher or one with very little experience? With the current attrition rates, chances are good that your child's teacher has relatively little experience since 10-20% of new teachers quit in the first year and 50% of all new teachers quit the profession within the first five years (National Commission on Teaching and America's Future, 2007). According to the U.S. Department of Education, National Center for Education Statistics (Snyder & Dillow, 2011, p. 110), 13.4% of K-12 teachers have fewer than three years of experience and an additional 33.6% have between three to nine years of experience. This means that 47% of all grade school teachers have fewer than 10 years of teaching experience. This represents a 4.2% increase over the 2004 numbers, and most experts predict that the numbers will increase substantially with the impending retirement of the "Baby Boom" generation teachers.

Although some teachers are born great, most have to develop their skills over years of practice before they become truly effective educators. Most experts agree that it takes between 3-7 years on average for a teacher to learn their craft well. "A body of research has conclusively shown that teachers improve dramatically between their first and second years of teaching, considerably so between their second and third, and relatively little in subsequent years" (National Council on Teacher Quality, 2009, p. 5). "Teacher quality matters. In fact, it is the most important school-related factor influencing student achievement" (King Rice, 2003, p. v).

Numerous other research studies agree that the number one factor affecting student achievement is a quality teacher in the classroom (Darling-Hammond (Ed.), 1994; Hanusheck, 1992; Hanusheck & Rivkin, 2004; Porter & Brophy, 1988; Rivkin, Hanusheck & Kain, 2005; Sanders & Rivers 1996; Schalock & Schalock, 1993; Shakrani, 2008; Wright, Horn & Sanders, 1997). With so many teachers leaving the profession early, too many students never get the benefit of learning from experienced teachers.

Politicians and activists like to state that education is a civil rights issue when they try to highlight the achievement gap that exists between schools in low-income neighborhoods and private schools or those schools that reside in neighborhoods that are more affluent. However, on a national level teacher attrition rates and teacher experience levels are two areas where most school types are approximately equal. Private schools suffer slightly higher attrition rates than public schools, while schools in low-income areas have attrition rates on par with the rest of public schools (Tables 1 and 2). Additionally, attrition rates do not differ significantly across salary range, gender, race/ethnicity or subject taught. Hence, high attrition rates are common and relatively equal in all types of schools and districts all across the United States (Tables 1 and 2). The nationwide average yearly retention rate for new public school teachers was 93% for the six years for which the U.S. Department of Education collected data. The average yearly retention rate for new private school teachers was only 87%, and the weighted average of the entire group of all teachers was 92% for those six years. These retention results count both those teachers still teaching at the same school (Stayers) and those who moved to another school (Movers). Since Movers still cost the school money and time by necessitating the recruiting and training of a new teacher to replace them, it is good to look at retention rates for only the Stayers as well. Counting only Stayers, the national average drops to 84.7% (85.4% Public, 80% Private). Fortunately, only

7.8% of new hires leave teaching for other professions in the first year. However, there still exists a 15% total nationwide turnover rate of new teachers that schools must replace each year, without taking into account retirements. That 15% turnover costs schools both financially and academically, so anything that can lower new teacher attrition is worth investigating.

Statement of the Problem

Teachers who receive insufficient support experience higher levels of stress and job dissatisfaction (Arnold-Rogers et al., 2008; CCTC, 1992; Darling-Hammond & Berry, Summer, 1999; Metropolitan Life, 2005). A lack of professionalism and the "isolation" of teaching are just two of the many factors that can contribute to stress and dissatisfaction. New teachers need more support dealing with student discipline, classroom management, creating/teaching lessons and curriculum issues - among other things (Huling-Austin & Murphy, 1987, April; Karge & Freiberg, 1992, April; Metropolitan Life 1991, 2006, 2008; Odell & Ferraro, 1992; Wilkinson, 1994). One of the first-year teachers participating in the Winstead Fry study "craved more support from her administrator and wished student teaching had provided her with experience interacting with administration" (2007, p. 218). Odell and Ferraro (1992) found that new teachers most valued emotional support and guidance in using instructional strategies and obtaining resources for the classroom, while they placed less importance on help with disciplining students and working with parents. Since the needs of new teachers vary so drastically, a "one-size-fits-all" attitude towards induction is not effective. Instead of prescriptive induction programs, Wilkinson suggests programs designed to "accommodate beginning teachers who are developmentally at different stages, who have different needs and require various types of assistance" (1994, p. 59). After studying 150 mentor-mentee pairings, Wildman, Magliaro, and

Niles came to a similar conclusion, stating that "mentoring, like good teaching, should be defined by those who carry it out" (1992, p. 212).

The reasons why teachers leave can vary as drastically as the types of support that they desire. However, new teachers often have additional reasons to leave the profession early because "they are often placed in the most disadvantaged schools and assigned the most difficult-to-teach students, with the greatest number of class preparations (many of them outside their field of expertise) and a slew of extracurricular duties" (NCTAF, 1996, p. 39). The U. S. Department of Education and other research institutions frequently collect data concerning the causes of teacher attrition. Some of the more common reasons cited in these studies are: a lack of planning time (65%), two heavy of a workload (60%), problematic student behavior (53%), and a lack of influence over school policy (52%). Beginning teachers are even more vulnerable to attrition because they often receive the low performing students and the less desirable classes. First year teachers often report feelings of isolation and abandonment. They want a mentor or guide whom they can observe modeling good teaching practices, and who can in return observe them teach and provide constructive feedback. They also want a support group of new teachers where they can discuss the trials and tribulations of being a new teacher. On average, new teachers report not receiving enough professional support, feedback, encouragement, or live demonstrations of what it takes to help their students succeed.

High attrition rates cause various problems for schools and societies. Recent studies show a strong link between high teacher attrition rates and the teacher shortages that plague most school districts. "It is widely concluded that one of the pivotal causes of inadequate school academic performance is a teacher shortage and the resulting inability of schools to adequately staff classrooms with qualified teachers" (Shakrani, 2008, p. 1). The recurring costs of recruiting,

hiring, and training new teachers in high attrition rate environments also affect school budgets. The National Commission on Teaching and America's Future (NCTAF) "estimates that the national cost of public school teacher turnover could be over $7.3 billion a year" (2007, p. 1). Other sources put the cost at anywhere between $4.9 billion (AEE, 2005) and $6 billion (Shakrani, 2008) annually. The NCTAF also reports that low performing schools have difficulty closing the achievement gap because they are constantly rebuilding their staff due to attrition and turnover. Large amounts of both human and financial capital "is consumed by a constant process of hiring and replacing beginning teachers who leave before they have mastered the ability to create a successful learning culture for their students" (Shakrani, 2008, p. 2).

Is There Really a Problem?

Some experts argue that teacher attrition rates are no higher than attrition rates in other similar fields like nursing. Current Department of Labor statistics support this viewpoint. According to data from the Job Openings and Labor Turnover Survey (JOLTS), the attrition rate in the education sector is one of the lowest in the private sector; averaging 12.9% over the last 10 years (see Table 3). However, the lack of more detailed statistics makes it difficult to know if these attrition rates are truly representative of teaching and nursing. The categories are too broad and may contain other subgroups that skew the data. For instance, nursing may have an average attrition rate much lower than 20.6%, but other larger subgroups within the "healthcare" category such as medical assistants and clerks, might have exceptionally high attrition rates. Similarly, the "education" category contains administrators that may have extremely low attrition rates that would lower the overall rate to something that is lower than the attrition rate of teachers. According to the U.S. Department of Education statistics, the attrition rate for teachers is roughly

15% on average per year, which is higher than the Department of Labor statistics, but still lower than any other category.

Although attrition rates for the educational sector may be lower than nurses and other comparable careers, teacher attrition is still significant to our society because it concerns the achievement of students, and the unfortunate truth is that the most promising teachers are the ones most prone to leave the profession first (Konanc, 1996). Teachers with the highest scores on certification tests are twice as likely to leave as those with the lowest scores (Henke, Chen, & Geis, 2000). Attrition rates are high enough to cause a financial and intellectual strain on most districts, and a good induction program will help to lower the rates and keep the best and the brightest doing the job. If students are to benefit from teachers who have perfected their craft, society must do whatever it can to minimize the premature loss of teachers.

Purpose and Significance of the Study

New teachers join the profession after investing years of schooling and tens of thousands of dollars in the hopes of making a difference in the lives of young people. Placing a first year teacher in a classroom without adequate support benefits no one. "With no mentoring or support for these teachers, …many give up before they have really learned to teach. Alone in their classrooms, without access to colleagues for problem solving or role modeling, discouragement can easily set in" (NCTAF, 1996, p. 39). Many states and school districts now use innovative induction programs to assist new teachers with the transition into their own classrooms. In addition to improving their feelings of efficacy and their range of instructional strategies, research suggests that teacher induction programs reduce new teacher attrition rates (Breaux & Wong, 2003; CCTC, 1992; Colbert &Wolff, 1992; Darling-Hammond & Berry, Summer, 1999; Huling-Austin & Murphy, 1987, April; Ingersoll & Kralik, 2004; Kaiser, 2011; Karge &

Freiberg, 1992, April; Odell & Ferraro, 1992; Shakrani, 2008). The goal of any induction program is better preparation, support, and retention of new teachers. In addition to serving the needs of new teachers, an effective induction program must address the needs of the administration as well. Unfortunately, not all induction programs are equal or effective. However, an effective induction program might include such components as:

- New teacher orientation that informs teachers about their school, the district, and even the neighborhood and student body. Answers to simple questions like, "Where is the break room?" and "How do I use the copy machine?" (Moir & Gless, Winter, 2001; Morgan & Kritsonis, 2008; Wong, 2001)
- Establishing learned mentors so that each beginning teacher can work closely with a veteran teacher in the same subject and grade level (Ciriza, 2005; Feiman-Nemser & Parker, Spring, 1992; Looney, 1997, February).
- Support teams that connect new teachers with groups of veteran teachers either currently teaching or retired who can assist and guide them in addition to their mentors (Cherubini, 2007; Ingersoll & Smith, 2004, Wong, 2003).
- Provide ample workshops, training, and professional development for beginning teachers that continues beyond the first year. These opportunities give new teachers vital information on topics relevant to their first year in the classroom (Curran & Goldrick, 2002; Robinson, 1998, October; Wong, 2005).
- Mentor training. Prior to becoming a mentor, each veteran must learn the skills necessary for effective mentoring (National Foundation for the Improvement of Education, Fall, 1999; Quinn & D'Amato Andrews, 2004; Scott, 1999).

- Release time and/or reduced class preparations for both the new teacher and their mentor. This affords them the time necessary to meet on a regular basis and discuss pertinent issues. It also allows them time to observe each other teach (Ganser, 1995, April; McConney & Maor, 2009; Winstead Fry 2007).
- Establish a peer support network where new teachers have the time to meet regularly with other new teachers to discuss relevant issues (Davis & Field Waite, Fall, 2006; Glassford & Salinitri, 2007; Rockoff, 2008).
- Mirrored schedules for new teachers and their mentors. Having the same daily free periods or regularly scheduled meeting times gives the new teacher easy access to their mentor (DeBolt, 1991, April; Marso & Pigge, 1990, February; Wood & Stanulis, 2009).
- Continued monitoring and support from the principal or administrators through the first three to five years of teaching where attrition rates are highest (Brewer, 2004; Ingersoll & Kralik, 2004; Wood, Fall, 2001).

An effective induction program may not need all of these components, but most successful induction programs have most or all of these components in some form or another. Current research suggests that implementation of a good induction program for new teachers lowers attrition rates, and one of the most important aspects of an effective induction program is mentoring. However, very little research has evaluated the direct impact of mentoring and induction on retention rates.

> Before l990, the literature on mentoring consisted mainly of program descriptions, survey-based evaluations, definitions of mentoring, and general discussions of mentors roles and responsibilities… [with] few comprehensive studies well-informed by theory

> and designed to examine in depth the context, content and consequences of mentoring. (Feiman-Nemser, 1996, p. 3)

This study plans to fill this gap in the literature by determining what aspects of induction programs are most effective, how can programs best utilize mentors, and what are the generalized components of an effective teacher induction program?

Before attempting to look for components of an effective program, this study needs to define what it means to be effective. For this study, an effective induction program is one that contributes to higher retention rates. Similarly, effective aspects of mentoring are those components that are associated with higher retention rates as well. If pre and post attrition data are not available, a comparison of the current program attrition rate to the current national average of 12.9% will determine a program's effectiveness.

Research Questions

This study hypothesizes that the implementation of an induction program will result in higher retention rates of newly hired teachers. Further, it is hypothesized that select components of an induction program such as mentoring will be more highly correlated with teacher retention. There are numerous publications on the components of induction programs (e.g., Brock & Grady, 1996, August; Curran & Goldrick, 2002; Davis & Field Waite, Fall, 2006; Ingersoll & Kralik, 2004; Wong, 2004). However, there is little published empirical data testing the effectiveness of these programs on teacher retention, and "the content, duration and delivery of programs are so varied from one site to another that it is not clear to what extent general conclusions about mentoring and induction can be drawn from the extant research" (Ingersoll & Kralik, 2004, p. 3). In this study, a nationally representative sample of teacher data from the

NCES 2009-10 Beginning Teacher Longitudinal Study will be used to investigate the association between induction programs and their components with teacher attrition rates.

In order to test the hypotheses that induction programs and specific components of induction programs will be associated with higher retention rates of newly hired teachers, the following research questions were investigated.

1. What are essential components of effective new teacher induction programs?
    a. What are the teacher induction components cited in the literature as being effective?
    b. How do induction program retention rates compare?
    c. Do induction programs identified as being effective include the induction program components most often cited in the literature?
2. Does participation in a teacher induction program and associated program components (e.g., seminars and common planning time) correlate with higher teacher retention rates for a national sample of teachers?
    a. Does participation in a new teacher induction program correlate with higher retention rates?
    b. Do induction programs that provide new teachers with reduced teaching schedules or fewer preparations correlate with higher retention rates?
    c. Do induction programs that provide new teachers with common planning time with teachers in their same subject correlate with higher retention rates?
    d. Do induction programs that provide new teachers with ongoing seminars and professional development correlate with higher retention rates?
    e. Do induction programs that provide new teachers with extra classroom assistance such as a teacher aide correlate with higher retention rates?

   f. Do induction programs that provide new teachers with regular supportive communication with their administrators correlate with higher retention rates?
   g. Do induction programs that provide new teachers with ongoing guidance or feedback from a mentor or master teacher correlate with higher retention rates?
   h. Do induction programs that provide new teachers with various combinations of the previously tested components correlate with higher retention rates?

3. Does participation in a teacher induction program with mentoring and associated mentoring components (e.g., mentor in same subject and/or grade, conducting observations) correlate with higher teacher retention rates for a national sample of teachers?
   a. Does having a mentor during the first year of induction correlate with higher retention rates?
   b. Does having a mentor with experience teaching either the same subject or the same grade level correlate with higher retention rates?
   c. Does the frequency with which new teachers meet with their mentors during the first year of induction correlate with higher retention rates?
   d. Does the frequency with which mentors observe new teachers present lessons during the first year of induction correlate with higher retention rates?
   e. Does the extent to which new teachers feel a mentor improved their overall teaching during the first year of induction correlate with higher retention rates?
4. Can a statistical model be developed to predict the likelihood of retaining a teacher after their first and second year of teaching based on selected induction program components?

Based on the literature review and national database comparison outcomes, a recommendation will be given of what an effective induction program should incorporate. Ideally, school

administrators could use the recommendations from this study to design a simple and cost-effective induction program that would help lower their new teacher attrition rates.

Paradigmatic Underpinnings

Morgan (2007) defines paradigms "as systems of beliefs and practices that influence how researchers select both the questions they study and the methods that they use to study them" (p. 49). According to Reichardt and Cook (1979), all of the attributes that make up the paradigms are logically independent, and the attributes are not logically linked to one another. Therefore, "there is nothing to stop the researcher, except perhaps tradition, from mixing and matching the attributes from the two paradigms to achieve that combination which is most appropriate for the research problem and setting at hand" (p. 18). This study utilizes attributes from the constructivist and post-positivist paradigms. As a mathematician, I want to believe in the positivist view that reality is out there to be studied, captured, and understood. However, as an educator, I have seen firsthand the constructivist theory that each student constructs his or her own reality. Therefore, the ontological viewpoint of this study mixes both paradigms. Epistemologically, this study follows the constructivist belief that the knower and the known are interactive and inseparable. The methodology is mostly post-positivist in nature using qualitative methods, frequency counts, and low-level statistics as well as chi square analyses and logistic regression analysis. All of this should result in a post-positivist study with good generalizations, descriptions, patterns, and grounded theory conclusions. For a more complete description of these paradigm attributes, see (Hatch, 2002, pp. 11-20).

Definition of Terms

Induction versus Mentoring Programs. This study is concerned with teacher induction; it is not just about mentoring. Various sources in the literature use the terms "induction

programs" and "mentoring programs" interchangeably. However, there is a difference between the two terms. A mentor is a component, albeit an important component, of an induction program. Induction is a comprehensive training and support process that continues for 2 or 3 years and fosters the lifelong professional development of new teachers in order to improve their effectiveness.

There is much confusion and misuse of the words mentoring and induction. The two terms are not synonymous. A mentor is a single person, whose basic function is to help a new teacher. Mentoring and induction are not equivalent. Mentoring is only one component of an effective induction program. For this reason, this study will use the more accurate term "induction program" when referring to any program designed to help new teachers transition into their first years of teaching.

Mentors. Some sources refer to mentor teachers as "guides", "coaches", "sponsors" or various other similar terms and phrases. Some programs give mentors other names like "Buddy" or "facilitator", and some programs split up the mentoring duties among several individuals. In this study, a "mentor" is defined to be any teacher (either currently employed or retired) who has years of teaching experience and helps guide a new teacher through their first years on the job by providing examples of good teaching, lesson design, classroom management, and any other necessary teaching related skills.

New Teachers. Most programs classify any teacher new to their school or district as a new teacher regardless of previous teaching experience. Most programs also require all new teachers to attend their induction programs even if the teacher has several years of K-12 teaching experience. The philosophy is that the teachers are still "new" to that particular school community, and the induction program helps them transition into a potentially new set of

customs and values. Unless stated otherwise, any program mentioned in this study characterizes all teachers new to their school or district as new teachers, and they require all of them to attend their induction programs regardless of previous teaching experience. However, the Beginning Teacher Longitudinal Study (BTLS) dataset only contains teachers that are new to teaching.

Stayers, Movers, Leavers and Returners. Stayers are teachers still teaching in the same school where they went through an induction program. Movers are teachers that are teaching in a different school, but still teaching. Leavers are teachers who are no longer teaching anywhere. Returners left the profession for a length of time and then came back to it later. Some programs only count Stayers in their retention rates, while most programs count both Stayers and Movers in their rates. Unless stated otherwise, any program discussed in this study counts both Stayers and Movers in their retention rates.

Cumulative versus Yearly Attrition/Retention Rates. Some programs list their retention rates yearly. This means that they only look at each cohort of teachers for one year after their induction year. For example, at the end of the 2004-05 school year, they see how many of the new teachers from the 2003-04 induction cohort are still teaching in their school or district. They might also do this for a multi-year time span as well and report how many of the 2003-04 teachers are still teaching after two years or five years. Some programs prefer more longitudinal data. They keep track of every cohort over a number of years, and their retention rates reflect how many teachers are still teaching after a cumulative number of years. For example, imagine a program that started in 2001-02. They might publish their retention rates in 2008 by showing how many teachers from each cohort year are still teaching in 2008, or they might just report the total rate. Either way, they are reporting how many are still teaching in 2008 rather than how many were still teaching at some fixed duration of time after each year.

Cohort/Cohort Year. A cohort or cohort year is the group of new teachers hired into a particular induction program in one academic year. If the Mt. Pleasant school district hires 57 teachers for the 2000-01 school year, then those 57 teachers are one cohort. When discussing how many of them are still teaching three years later, one would refer to them as the 2000-01 cohort or cohort year.

Summary

This research study adds to the minimal amount of research that exists on the quantifiable impact of induction programs and the associated components on new teacher attrition rates. The findings will help public school administrators design new teacher induction programs with components associated with higher probabilities of new teacher retention in the first three years.

Chapter 2

Review of the Literature

Introduction

In this chapter, a thorough examination of the background literature related to induction programs will provide grounding related to the research questions of this study. The review of the literature has four sections. The first section examines attrition rates and their causes and costs. The second section lists some of the induction programs from the United States that the literature references as being effective at reducing attrition rates. The third section compares the success rates of various induction programs, while the fourth section looks for common components in those programs that are successful at reducing new teacher attrition rates.

Attrition Rates - Causes and Costs

Not only does high teacher attrition cost schools fiscally, but it also costs them academically. "When assigned to a first-year teacher, the average student gains .06 to .08 standard deviations of achievement less than observably similar students assigned to experienced teachers" (Staiger & Rockoff, 2010, p. 102). Students assigned to second-year teachers saw gains only .01 to .04 standard deviations below students assigned to veteran teachers, and students of third year teachers saw gains on par with those of veteran teachers. Most teachers need three to five years of teaching experience before they become competent and confident in their abilities, and 50% of new teachers quit within their first five years. As a result, our students suffer from a lack of veteran teachers, while already financially burdened schools suffer further budgetary constraints by having to find, hire, and train a new work force every year.

Causes. According to research, there are several different factors contributing to high teacher attrition rates. "The National Commission on Teaching and America's Future (2003)

found that a lack of opportunity for continued preparation and guidance in teachers' formative teaching years was a primary reason for teacher job dissatisfaction" (McNeil, Wood, Kurtz, Thousand, & Nevin, 2006, November, p. 1). Various sources cite low pay as a possible cause (Andrews & Carr, 2004; Ingersoll & Rossi, 1995; Morgan & Kritsonis, 2008; Shakrani, 2008). Additional research cites causes such as unpreparedness, feelings of not belonging or isolation, classroom management, poor leadership, and a general lack of support (Arends & Rigazio-DiGilio, 2000, July; Arnold-Rogers et al., 2008; Cherubini, 2007; Ingersoll & Rossi, 1995; Metropolitan Life, 1991, 2005, 2006, 2008; Morgan & Kritsonis, 2008; Quinn & D'Amato Andrews, 2004; Shakrani, 2008; Winstead Fry, 2007; Wong, 2001, 2003, 2004). Of course, some teachers leave the profession to start a family, to retire, or for other personal reasons. However, too many teachers are leaving for reasons that an effective induction program could potentially alleviate.

Costs. The cost of high teacher turnover is both academic and economic. Academically, it is difficult to provide students with quality teachers if the teachers leave before they are able to develop their skills. "It is widely concluded that one of the pivotal causes of inadequate school academic performance is a teacher shortage and the resulting inability of schools to adequately staff classrooms with qualified teachers" (Shakrani, 2008, p. 1). According to the National Commission on Teaching and America's Future (2007, p. 3), "a caring, competent, and qualified teacher for every child" is the most important ingredient in education reform. "Based on research in Texas, the importance of having an effective teacher instead of an average teacher for four or five years in a row could essentially close the gap in math performance between students from low income and high income households" (Wong, 2004, p. 41).

> Based on the gains that teachers make in their first few years of experience, every time a school district loses an experienced teacher with two or more years of experience and is forced to hire a novice teacher, the students assigned to the novice teacher over the first two years of their career lose roughly .10 standard deviations in student achievement. (Staiger & Rockoff, 2010, p. 103)

Some researchers argue that an average annual attrition rate of 13% (US Department of Labor Bureau of Labor Statistics, 2010) over the last 10 years is not that bad when compared to other professions. However, numerous studies show that the "best and the brightest" appear to be the ones most likely to leave the profession (Henke et al., 2000; Ingersoll & Kralik, 2004; Murnane, Singer, Willett, Kemple, & Olsen (Eds.), 1991; Schlechty & Vance, 1981), which makes any level of teacher attrition a costly problem for society.

In addition to the academic costs, there is a high financial cost associated with teacher turnover. The US Department of Education National Center for Education Statistics (2011b) estimated that teacher attrition cost schools nearly $4.9 billion per year in 2000, and their estimate rose to $7 billion annually in 2010. The Department of Labor conservatively estimates that attrition costs the school 30% of the leaving employee's salary. The Alliance for Excellent Education (2005) gave a conservative national estimate of $2.2 billion per year to replace just the public school teachers who left the profession. This estimate did not include those teachers who transferred to another school or those that left private schools. When the estimate includes the cost of replacing teachers who transfer to other schools, the estimate reaches $6 billion annually for public schools alone. When estimating the approximate dollar value of student achievement over the course of a student's lifetime, Staiger and Rockoff estimate that "a .10 standard deviation gain in math scores has a value of roughly $10,000 to $25,000 per student" (2010, p.

103). With an average class size of 20 to 24 students, the cost of lower academic achievement due to the loss of an experienced teacher can be as high as $500,000 per class. Whether you measure the cost in dollars or academic performance, the cost of teacher attrition is too high to continue at its current rate.

Retention Rates

There are dozens of new teacher induction programs cited in the literature as being successful. Unfortunately, many of these programs do not report empirical data results or any form of statistics indicating a reduction in attrition rates. However, it was possible to find retention rates for the 11 programs cited most frequently in the review of the literature as well as another dozen or so lesser-known programs. Discussions of the 11 better-known programs are in the next section, and an additional 11 of the lesser-known programs are included in Table 4.

Comparison Problems. A problem arises when trying to compare retention rate results from more than one induction program. Some programs only count Stayers in their retention rates, while other programs count both Stayers and Movers. Sometimes it is logically sound to include Movers in retention rates. For instance, if an induction program is district-wide or statewide, teachers moving within the district or state should not count as Movers since their movement does not cause an employment vacancy for the agency running the induction program. They would have to "move" outside of the area serviced by the induction program before there would be a need to hire another new teacher. However, if an induction program exists at the school level, any teacher who moves to another school, district, or state would have to be replaced and newly mentored. Therefore, only Stayers would be applicable for retention rate calculations in this situation. In order to avoid underestimating the proportion of teachers needing induction programs, the national average is computed using only Stayers. Unfortunately,

most programs fail to mention whether or not their results include Movers. In order to compare the rates with the national average retention rate of Stayers (85%), this study will assume results only include Stayers whenever the source fails to state explicitly whether the rate includes Movers. Whenever possible, this study will let the reader know when a result includes Movers in the retention rate.

A separate problem arises when comparing results because of the different ways in which programs calculate their results. As defined earlier, the two different ways of calculating results are yearly and cumulative. Yearly results simply list the percentage of teachers still teaching after one year, while cumulative results list the percentage of teachers still teaching after a number of years. For instance, one program might collect retention rates at the end of each academic year from 2000-01 to 2004 -05, and report those five yearly rates separately. Even though the oldest cohort in this example is from five years ago, this study does not consider this a five-year retention rate. It is merely a one-year retention rate that happens to be from five years ago. It only represents the percentage of teachers who continued to teach after one year (i.e., still teaching in 2001-02). These are merely five separate individual one-year or yearly retention rates.

Some programs might report the average of these five yearly rates. This of course brings up the question of whether or not they weighted the averages based upon the sizes of each cohort year. Unless all of the cohort years have the same number of new teachers, an average of those yearly rates is mathematically inaccurate. For a simple example, consider a school district that hires 100 new teachers the first year. They have a great induction program, and only 10 of them leave the district by the end of the year for a 90% retention rate. Now, the second year, they hire 10 teachers to replace those who left, and all 10 leave at the end of that year for a 0% retention

rate. So, is the average yearly retention rate really just 45% (the average of 90% and 0%)? The weighted average is (how many total people remained for a year) over (the total hired) = (90+0)/(100+10) = 90/110 = 81.8%. Thus, each person receives equal weight, and 81.8% is a more accurate average yearly retention rate. Since the chances of a school or district hiring the same number of teachers each year is very low, any average yearly rate that is not weighted may be inaccurate. Unless stated otherwise, it is assumed that the results stated are NOT weighted.

Alternatively, a program might present a single retention rate for this five-year time-span cumulatively. In this case, they would keep track of how many teachers from all five cohorts are still teaching at the end of the 2004 -05 academic year, and report that overall percentage as a five-year cumulative retention rate. Again, this study does not consider this a five-year retention rate because only one cohort (2000-01) has been teaching for five years, while the rest of the cohorts have not. The 2001-02 cohort only has four years of teaching experience, and it goes down from there. If they wanted to present a five-year retention rate for all five cohorts, they would need to calculate it five times over five years. They would not know the five-year retention rate of the 2004-05 cohort until the end of the 2009-10 school year.

Assumptions. So, how does someone compare a yearly retention rate to a three-year rate and a five-year cumulative rate? Simple, they don't! Instead, one must convert each rate into a yearly rate. In order to convert the rates, one would need to make two assumptions about the cohorts from each program. First, one must assume that cohorts from a particular program are the same size in order to allow for the unweighted average of their rates. Second, one must assume that each program has a constant rate of attrition from year to year in order to do logarithmic regression on the rates. The assumption of a constant rate of attrition also makes it possible to project a yearly rate out to a two-year and five-year rate. Most likely, these two

assumptions are not true, but they are necessary for the computations. Therefore, readers must use caution when interpreting computed retention rates.

Designations and Calculations. Some programs were thorough enough to list yearly, two-year, and five-year retention rates, and those appear as reported in Table 4 without any asterisks or markings. If a program provided multiple rates for any of the three categories, a mean of the rates is displayed and designated with an "a" for averaged. Because retention rates can fluctuate drastically from one year to the next, average rates are used whenever possible. Even with the problem of not being able to weight each rate properly, the author believes that an average rate more closely represents the program's success. Whenever possible, this study computed a weighted mean, and designated it with a "w" in Table 4. When programs only provided off year rates like three-year or ten-year rates, exponential regression was used to calculate any missing rates. An "r" designates rates in Table 4 that were calculated with regression techniques. A "p" represents any rate obtained by raising a different rate to a power.

Column seven "%Δ" in Table 4 presents the percent change in yearly attrition rates. Some sources provided preprogram retention rate data for the school or district. In other cases, either a control group or comparable school or district rate was available. Whenever such rates were available, percent change in attrition was calculated and provided in column seven of Table 4. Since these values represent a percent drop in attrition rates, higher values indicate a more effective program. Thus, all of the percentage data in Table 4 are consistent in that higher values denote higher levels of effectiveness. In every instance except one (BTSA Statewide), the percent change is calculated by taking the difference between the two yearly rates (pre and post, or program and control) and dividing it by the original or control rate. The BTSA rates were two-

year rates, so they were first converted to yearly rates by taking their square roots before computing the percent change.

The last column in Table 4 "Norm" represents the calculated yearly rate for each program normalized to the national average. Since some programs took place in schools or districts with attrition rates far higher than the national average, it is not fair to compare them to the national average when assessing their effectiveness at lowering attrition. If an induction program results in a retention rate of 84%, it might be considered ineffective since the national average is 85%, but that school or district may have had a retention rate of 70% or even 50% before the start of the program. Therefore, when the data were available, the author computed the percent change in attrition rates and a corresponding "normalized" yearly retention rate. This normalized rate represents what the retention rate would be if the program were applied to a school or district that started at the national average of 85%. Take the MUSE results for example. This program reported a yearly retention rate of only 89%. However, the National Center for Education Statistics (NCES) mobility report from the 2008-09 Teacher Follow-up Survey (TFS) data reported on page 9 that 27.5% of special education teachers leave in the first year nationally. Thus, this program theoretically reduced the attrition rate from 27.5% to only 11% or a (27.5 – 11)/27.5 = 60% reduction. Therefore, if the same percent change were applied to a school or district that began with the national average attrition rate of 15%, in theory, it would expect the same 60% reduction in attrition. This means the program would theoretically normalize nationally to a 94% retention rate.

Conversion Procedures. All of the rates denoted with an "r" in Table 4 were computed using the GROWTH function in Microsoft Excel 2007. It performs a simple exponential regression on a set of known independent and dependent values. If a program supplied the

retention rates for one-year (85%), two-year (70%), and three-year (82%), the GROWTH function would use (0, 1, 2, 3) as the independent variables and (1, .85, .7, .82) as the dependent variables. The GROWTH function regresses an exponential function of best fit onto those data points and returns calculated values for any requested year's rate. Additionally, this study utilized the LOGEST function to return a full array of statistics associated with the regression function. The GROWTH function provided an easy way to compute yearly, two-year, and five-year rates from any set of rates, while the LOGEST function provided a check for the goodness of fit with the returned correlation coefficient *r* and other statistics.

Every rate in Table 4 designated with a "p" was calculated by simply raising a given rate to a power in order to calculate the other rates. Since this is a far less robust method than exponential regression and therefore more likely to lead to inaccurate estimates, it was only used when necessary. If only one rate was available for a program, it was not enough data to run an exponential regression with an acceptable level of accuracy. So, in those few cases where only one rate was available, the other rates were calculated as powers of the given rate. For instance, the Clark County program in Nevada only provided its yearly retention rate of 92.5% (Breaux & Wong, 2003, p. 110), so the two year and five years rates were obtained by raising the yearly rate to the powers of two and five respectively. Like all other calculations, this assumes a constant rate of attrition from year to year.

Effective Induction Programs

Various studies point out effective induction programs. Some provide empirical data to support their claim that their program reduces attrition rates, but most only offer anecdotal evidence such as rave reviews from outside experts who believe the program is effective. Ingersoll and Kralik (2004) list six programs that show positive results. Programs such as the

California Mentor Teacher Induction Program (MTIP) and the New York City Retired-Teachers-as-Mentors Program showed only slight positive effects on retention rates. However, other programs such as the Toronto Teacher Peer Support Program, Montana Beginning Teacher Support Program (BTSP), Flowing Wells, Connecticut Beginning Educator Support and Training (CT BEST), California Beginning Teacher Support and Assessment (BTSA) and Lafourche Parish Public Schools all showed strong results. This study chose to discuss in detail the six programs cited most often in the literature (BTSA, CMP STIR, CT BEST, Flowing Wells, Islip, and Lafourche), as well as five other notable programs of interest (Glendale, Montana BTSP, Oconee, Rochester, and South TX).

California Beginning Teacher Support and Assessment (BTSA). According to the California Education Code, Section 44279.2 (b), the purpose of the BTSA is to "improve student educational performance through improved training, support, information and assistance for new teachers." The BTSA is a two-year program started in 1997 that includes collaboration, a structured individualized induction plan, experienced mentors, and the creation of a community of learners. According to a report by Curran and Goldrick (2002), 129 of the 133 statewide programs reported average 1-year and 2-year retention rates of 96% and 94% respectively in 1999-2000. "Over five years, the program resulted in an attrition rate of 9% for beginning teachers. In contrast, the attrition rate among new teachers in California who did not participate in BTSA or a similar induction program was 37%" (Curran & Goldrick, 2002, p. 5). Other sources cited similar statistics. "Outcome data for the first two years of implementation revealed retention rates for first and second-year beginning teachers were extremely high in the 145 statewide induction programs - approximately 93% regardless of size of school district" (McNeil et al., 2006, November, p. 2). Additionally, follow-up data from 2004 showed 84% of

participants from all three years continued to teach, and many beginning teachers had become mentors themselves. “It seems that the induction program provided the necessary support that empowered new teachers to transition from their role as inexperienced teachers into competent and confident practicing teachers” (McNeil et al., 2006, November, p. 2).

The BTSA program is mandatory for all new teachers as part of their licensure and credentialing, so there is no control group to compare results. However, a comparison of their results to the national average, and long-term data collected by the Commission on Teacher Credentialing (CTC) shows attrition rates far lower than the national averages. In December of 2008, the first set of BTSA results showed that 93.8% of the 2007-08 teachers were still teaching after two years, and 92.1% of the 2006-07 teachers were still teaching after three years. After four years, 89.7% of their teachers were still teaching, and 87.2% were still teaching after five years. The CTC released their results again in February of 2011, and the BTSA retention rates had dropped. Only 85.8% were still teaching after two years and 75.9% were still teaching after five years. Although the retention rates had decreased, the BTSA program still showed enormous improvements over the national average of only 50% still teaching after five years.

The BTSA Statewide rates presented in Table 4 are exponentially regressed aggregates from numerous data points. The data came from the CTC Statistic of the Month December 2008 and February 2011 reports available at their website (http://www.ctc.ca.gov/educator-prep/statistics-archive.html). Figures 1 and 2 present the data. This study used the data from 2008 as presented, but the 2011 data needed a small adjustment. Since the CTC collected the data for their second set of results during the spring semester of 2011, it was assumed that the rates would not change by the end of the school year. Thus, the 2009-10 result is a two-year result since it is assumed that the rates should be the same at the end of the 2010-11 year. The

author regressed the data with half years for the 2011 data (i.e., 1.5 years for 2009-10), but the goodness of fit dropped. By rounding to the next highest integer year, the regression coefficient was only moderate (r = -.65), however it was stronger than when half-years were used (r = -.55). Additionally, the percentages of teachers who moved into administration and pupil personnel services were added into the rates for each year since their movement resulted in a vacancy but also filled a vacancy and was not representative of a net loss of staff in the school or district. The regression analysis resulted in rates of 93%, 89.3%, and 79% for one-year, two-year, and five-year time spans. According to Strong's book (2009, p. 40), 77.6% of BTSA teachers were still teaching after two years compared to only 46.3% on non-BTSA participants. Assuming a constant attrition rate over those two years, this equates to one-year retention rates of 88.1% and 68% respectively. This represents a 62.8% reduction in attrition, which normalizes to a 94.4% one year retention rate when compared to the national average.

California Mathematics Project Supporting Teachers to Increase Retention (CMP STIR). The California Postsecondary Education Commission Improving Teacher Quality (ITQ) grant funded CMP STIR with the goal of increasing the retention of teachers of mathematics in the profession and within the school. Several state and national reports cite that neither the state nor the nation has enough qualified mathematics and science teachers. "In fact, a report from the California Commission on Teacher Credentialing (CCTC) shows that California's demand for qualified STEM (Science, Technology, Engineering, and Mathematics) teachers exceeds the supply by many thousands of teachers each year" (California Mathematics Project Supporting Teachers to Increase Retention (CMP STIR), 2006). One solution was the California's Science-Mathematics Initiative, which charged the University of California and California State University with the training of 1,500 new STEM teachers annually. The ITQ Science and

Mathematics Teacher Retention Initiative (Winter, 2006) sought to increase STEM teacher numbers by reducing new teacher attrition through the use of quality professional development programs.

In the fall of 2006, CMP STIR awarded 10 out its 19 regional sites with grants to provide a comprehensive induction program for new teachers or teachers in hard-to-staff schools. Each CMP STIR site provided intensive professional development and sustained support for the teachers at the school site (e.g., administrative support, mentoring and coaching, Lesson Study, school site networking, data reflection, or access to resources). Each site had at least 27 teachers per retention cohort in the first three project years. In 2010-11, the sites provided professional development for 10 additional teachers while focusing on education advancement and/or increasing the leadership roles of the retention cohort. In 2011-12, each site will provide another 10 teachers with professional development focusing on teacher retention. On March 22-24, 2012, CMP STIR plans to hold the Mathematics Teacher Retention Symposium to address the teacher retention issue on a national scale and to disseminate the findings of CMP STIR. The findings from this study will be among those discussed.

According to data received directly from CMP STIR via email correspondence on 7/27/2011, new teacher retention rose after the implementation of the program. Before 2006, the data showed yearly attrition at 20% consistently across 5 years and a five-year cumulative rate to be about 54%. The three years of the study produced varying results, but the average attrition for the first year was 14.9%, the second year was 9.3%, and the third year was 6.0% with a three-year cumulative rate of 22.5%. The trend implies that the program is becoming more successful as it adjusts each year, and if it continues at this pace, it could achieve a 100% retention rate within the next few years. The program achieved an average yearly retention rate of 89.9% over

the first three years of the new program, which represents a 49.5% reduction in the attrition rate prior to the implementation of the program. When compared to the national average, the normalized yearly rate is 92.4%.

Connecticut Beginning Educator Support and Training (CT BEST). The BEST program began in 1989 as a one-year program of mentoring and classroom-based observations utilizing the Connecticut Competency Instrument. Soon, it transitioned to a two-year program of school and state-based support requiring the completion of a content-specific portfolio in year two, with a third year of support available if necessary. The central mission of BEST was to ensure that a highly qualified and competent teacher teaches every Connecticut student. During the first year, new teachers met periodically with an assigned mentor teacher and attended regularly scheduled workshops and seminars throughout the year. The culminating activity of the entire program was a portfolio project due at the end of the second year. A teacher had to receive a passing score on the portfolio project in order to receive full certification.

To help teachers earn certification and remain in education, Connecticut kept a pool of about 12 teachers-in-residence from various disciplines. Each teacher-in-residence took a two-year leave of absence from their school district in order to work with the state's BEST program to conduct seminars and workshops for new teachers, prepare manuals, and score portfolios. The portfolios included documentation of between five and eight days of instruction in the same class, examples of student work, videotapes of two lessons, and a self-analysis of the teacher's performance. Each summer, teachers-in-residence at the Connecticut Department of Education would evaluate more than 2,000 portfolios with approximately 85% receiving passing grades on average. Only about 2% do not pass their second attempt at the end of the third year of teaching, either by not submitting a portfolio or by not meeting the standard. Portfolios are graded on a

scale of one to four, with a two or higher being a passing score. Those who score below two may resubmit a portfolio in their third year. If that portfolio also scores below two, they are no longer candidates for certification and their contracts are not renewed. "Among the factors considered in the portfolio assessment are teachers' abilities to plan and implement instruction, to evaluate student learning and analyze their own teaching, to know their students, and to adapt instruction for individual students" (Delisio, 2011, p. 1).

In May 2008, the Connecticut Legislature passed Public Act 08-107, which called for the replacement of the BEST Program with a new beginning teacher program, effective July 1, 2009. As a result, the program went through a transitional period beginning with the 2008-09 school year. During the 2008-09 school year, teachers continued to submit portfolios but they were not required to submit videos as part of their portfolio. As always, teachers-in-residence evaluated all portfolios and provided feedback to each beginning teacher. In 2009, the Teacher Education and Mentoring (TEAM) program replaced BEST. Where BEST was originally a state-based assessment and certification program, the new TEAM program focused more heavily on guided teacher support, coaching, and the completion of learning modules over the first two years of teaching. "Both programs define clear linkages to teacher certification, but [TEAM] places greater responsibility on districts to embed mentoring within a comprehensive system of teacher evaluation and professional development, while maintaining the independence and confidentiality of the mentor-beginning teacher relationship" (Connecticut State Department of Education, 2008, p. 1). The major difference was a shift from a state-based program to a district-based program. See (http://www.ctteam.org/ ?page_id=2) for more information on the new TEAM program.

Data acquisition was difficult because the TEAM program already replaced the BEST program. However, Barbara Canzonetti, an education consultant with the Connecticut State Department of Education was able to provide detailed data on the 2005 cohort (N = 2826) of teachers. According to the data 479 (16.9%) did not complete the BEST program and therefore should not count towards total participants. Of the 2,347 teachers who did complete the program, only 210 (8.9%) left after one year. Additionally, 1249 (53.2%) were still teaching in the same school continuously for five years, and 1536 (65.4%) taught in the same district for five years. Since this is a statewide program, districts do not need to replace Movers within a district, and therefore Movers should not count as attrition from the program. Regression analysis resulted in an approximated two-year rate of 84.1%, r = -0.9998. Interestingly, counting Returners as well as those who moved out of state, results in 2105 (89.7%) teaching somewhere during the 2010-11 school year when the national average is less than 50% over the same time span.

Flowing Wells Teacher Induction Program for Success (TIPS). The Flowing Wells School District is a small suburban district in Tucson, Arizona. Over 50% of the students are eligible for free or reduced-rate lunches, yet they still give education top priority with an induction program that some experts believe to be the best that exists (Breaux & Wong, 2003). The district began (TIPS) in 1985, and it has continued to receive national recognition and awards. According to their website (2011), the Flowing Wells Induction Program emphasizes five critical attributes that are the cornerstones of the vision:

- Effective instructional practices
- Effective classroom management procedures and routines
- A sensitivity and understanding of the unique community we serve
- Teaching is a reflection of lifelong learning and professional growth

- Unity of teamwork among administration, teachers, support staff and community members is essential

The program offers differentiated staff development matched to the level of teaching expertise for all teachers new to the district. The TIPS program offers ongoing professional development throughout the entire career of each teacher. “This is the way induction should be and it is one of the main reasons that Flowing Wells is one of the most effective districts in the United States” (Breaux & Wong, 2003, p. 86).The program begins with a four-day intensive training seminar before school begins in August that focuses on classroom management and instructional strategies. Four more days of induction occur in September, November, January, and March that include on-site demonstration classrooms in instruction as well as an awards ceremony on the last day.

Throughout the year, a staff development coordinator serves as a “mentor” and observes each new teacher five times with the purpose of helping the new teachers to focus on their strengths, weaknesses, and professional development. The instructional coordinators continue to mentor the new teachers during their second year of teaching as well. The coordinators are master teachers who receive stipends and release time to work with each teacher. Each mentor is in the same grade level or subject of each new teacher, and they continue to emphasize instructional strategies, professional skills, classroom management techniques, assessment techniques, and policies and procedures. In the third and fourth years, the instructional coordinators continue to observe and support the teachers by providing advanced training in areas such as instructional strategies, cooperative learning, and higher-level thinking. This ongoing staff professional development offers personalized training for each teacher along with formative and summative observations and evaluations at each level of progression.

The success of the Flowing Wells program goes far beyond retention rate data. Countless other districts have copied the program. In fact, the program is so popular that the Flowing Wells district holds a two-day national induction-training seminar each year where educators learn how to implement the program in their own schools. According to Breaux and Wong (2003), the following outcomes are typical of the TIPS program or any other program using their model:

- Reduced anxiety of first-year teachers
- A higher-quality teaching force
- A reduced attrition rate for new teachers
- Increased student achievement
- A common culture throughout the district
- A common mission and set of goals
- A common professional dialogue among teachers, staff, and the community
- A willingness to participate in career-long staff development

The Flowing Wells website (2011) lists these program outcomes in their *Induction & and Mentoring Brochure*:

- One hundred percent of all new teachers to Flowing Wells attend the induction program during their first year in the district.
- Approximately 70% of all Flowing Wells teachers attend staff development training each year on a voluntary basis.
- Based on feedback from school principals, the quality of teaching performance has improved significantly.

- "Proficient" and "Expert" teachers design individual growth plans based on increased awareness of teaching research and methodology. These teachers are the Mentor/Instructional Coordinators that provide the new teacher support.
- An increased ability for teachers to reflect on their instructional practices has promoted professional dialogue among teachers, support staff, and community.
- An attitude that "professional growth" is the norm for a Flowing Wells educator is evidenced by participation in after school and summer workshops.

Both lists paint a picture of a highly effective induction program. Unfortunately, the only available retention data does not support that claim on the surface. See Table 5 for a listing of the cumulative retention rates for the last 11 years of the program. With retention rates ranging from 9% to 65%, it would seem that this program would not be considered effective at lowering attrition rates. However, there are three key things to remember about these results. First, the numbers represent only Stayers. Second, Arizona and particularly the Flowing Wells area traditionally experienced attrition rates much higher than the national average. Third, and most importantly, these are cumulative rates. Most programs count both Stayers and Movers while providing yearly instead of cumulative rates because both practices result in the reporting of larger retention rates.

Had Flowing Wells counted both Stayers and Movers, their numbers would be far more impressive. Email correspondence from the current Director of Staff Development at Flowing Wells, Dr. Kevin Stoltzfus, acknowledged that the rates did not seem impressive when compared to other programs. However, Dr. Stoltzfus did confirm the theory that approximately two-thirds of the "lost" teachers are Movers and not Leavers. Since this is a district-wide program, Movers should not count towards attrition. Even with a more conservative guess of only half being

Movers (which is what the national data suggests); the rates are above national averages. Regressing the original 11 years worth of data results in retention rates of (78.0, 67.4, and 43.6). Using the data with half of the missing teachers added back as Movers resulted in retention rates of (87.2, 83.9, 74.8), r = -0.86, which are all on par with other effective programs. Results cited in the Breaux and Wong book (2003, p. 93) claim a yearly retention rate of 89%, which matches the results obtained when adding back half of the lost teachers as Movers.

Another more accurate way to assess the impact of the induction program on retention is to compare it to pre-program or control group data. There is no control group for most programs (this one included); however, there is comparable statewide attrition rate data for districts without induction programs. According to various sources, similar districts in Arizona typically suffer from retention rates as low as 47%. Without adding back the "lost" Movers, Flowing Wells still reduces attrition by 70.8%.

Instead of reporting the yearly retention rate for each of the 11 cohorts listed, Table 5 reports each cohort's cumulative retention rate at the end of the 2010-11 school year. Another conversion to aid with comparing program rates is to take the cumulative rates and convert to yearly rates by assuming a constant yearly attrition rate. This does not mean that a 30% attrition rate over three years equates to a 30/3 = 10% per year attrition. Cumulative rates are similar to compound interest, so you have to solve for an exponential $(\text{e.g., } x^3 = .70)$. This example would yield a retention rate of 88.8% or roughly 89%. The third column in Table 5 "Estimated yearly rate" lists each cumulative rate converted to a yearly rate assuming a constant yearly attrition rate for each cohort. For the sake of comparisons, these estimates result in an average yearly retention rate of 84.5%. Assuming a constant yearly attrition rate is a large assumption to make, but it is the only way to compare cumulative rates to yearly rates. Because so many

programs report their statistics differently, it is impossible to accurately compare and rank programs based upon their reported retention rates, but that is not the intension of this study. Instead, this study strives to identify those programs that are effective based upon their results, and the Flowing Wells program appears to be one of the oldest and most effective long-term induction programs in the United States.

Glendale Union High School District. The GUHSD has nine comprehensive and two alternative campuses serving over 15,000 students in Glendale and North Phoenix, Arizona. The GUHSD developed a new induction program in 1991 that assigned one teacher in each of their nine schools to mentor all new teachers in their building during their first three years of teaching. The mentors would teach two classes per day and then be released from teaching for the other three periods to support the new teachers in their school. They felt that keeping them in the classroom would strengthen their bond with classroom teachers, and it allowed the teachers union to support their positions as still being academic. Participation in the program is mandatory for all new teachers, and experienced mentors train new mentors while they themselves obtain ongoing staff development through the National Staff Development Council, district curriculum coordinators, district administrators, and the New Teacher Center at the University of California, Santa Cruz. "Mentors train each other, by sharing different areas of expertise. They meet at the district office every Friday to support each other, plan together, and train each other" (Villani, 2009, p. 42). According to Villani (2009, p. 40), the goals of the program are to:

- Accelerate good teacher decision-making in the classroom
- Retain quality first, second, and third year teachers for a lifetime career in GUHSD
- Provide support and improvement in instructional skills

- Provide a solid grounding in the district learning system
- Assist teachers in developing a collegial network for support

As with other successful programs, this one has similar goals and components that include some sense of community and a support network along with experienced mentors that will likely lead to higher retention levels of new teachers.

Since the implementation of the induction program in 1991, the retention rates in the GUHSD have surpassed the national averages. However, the data available make it difficult to determine the exact yearly rates, and some of the authors interpret the results in odd ways. Susan Villani (2009, p. 37) claims the "retention of teachers hired between 2005 and 2008 averaged 79% in 2008," which appears incorrect. GUHSD provided their retention rates as the percentage of "teachers remaining in the district as of August 2008." This means that the rate of 85% from the 2007 cohort is a yearly rate, but the results from cohort years 2006 (70%) and 2005 (82%) are both cumulative. Villani merely averaged the three percentages when reporting the 79% statistic. In order to compare these two vastly different types of retention rate statistics and compute an average yearly retention rate, one would have to assume a constant yearly rate of attrition and convert the two cumulative rates into yearly rates. Assuming a constant yearly attrition rate, the yearly retention rates are 94% and 84% respectively for cohort years 2005 and 2006. The average of these three yearly rates (which is also inappropriate since that assumes equal cohort sizes for each year) is 88%. Recall that the national average is 85% for one year. Table 4 reports the yearly and two-year rates from the data since they are reported rates rather than extrapolated or computed rates. The five-year rate (63.4%, r = -0.70) came from the regression of the three rates given. Even though 85% is the same as the national average, this program can claim success when compared to the pre-program rate of 47%. This implies that the

induction program contributed to a 71.1% reduction in attrition, which normalizes to a 95.8% yearly rate.

Islip New Teacher Induction Program (INTIP). The Islip School district, located on Long Island, New York, created a three-year induction program in 1996. Prior to the beginning of the school year, all probationary teachers are required to attend a three-day orientation program facilitated by the Assistant Superintendent. It covers basic procedural information, introductions, a bus tour of the area, and team building exercises. All probationary teachers are also required to participate in monthly induction meetings facilitated by the Assistant Superintendent. "Induction is theme oriented and defined as ongoing professional development throughout the school year" (Lippman, 2003, p. 1). In order to build relationships and support groups, each group of new teachers proceeds through their three-year tenure track program as a cohort, and collaboration is continually encouraged.

The theme of the first year is classroom management techniques and interventions for encouraging appropriate student behavior. They learn that discipline is a part of teaching, and they learn ways of dealing with students who chose to misbehave. *The Effective Teacher* DVD series and the book, *The First Days of School*, by Harry and Rosemary Wong are jumping off points for discussions, while Linda Albert's *Cooperative Discipline* is the focus of monthly meetings. Other workshop topics include Parent Teacher Conferencing Strategies, and Open School Night suggestions.

Year two teachers have a two-day orientation facilitated by the Assistant Superintendent. The theme of the second year is instructional strategies. Both *The Art and Science of Teaching* and *Classroom Instruction that Works* by Robert Marzano are part of year-two professional development sessions that focus on instructional strategies. Sessions cover topics including

learning goals, assessment techniques, and the ability to monitor and adjust instruction. Teachers define instructional strategies and team-building activities are included within their professional learning-community to promote a sense of cohesion and belonging. The instructional strategies foster student learning, growth, and achievement.

Year three teachers have a two -day orientation facilitated by the Assistant Superintendent that focuses on differentiation and big picture ideas. *The Differentiated Classroom* by Carol Ann Tomlinson and *Understanding by Design* by McTighe and Wiggins are essential tools during this year while teachers design instruction for the needs of each student. In the third year of the induction program, workshops on multiple intelligences, cooperative learning, differentiated instruction, positive expectations and more offer teachers the opportunity for continued professional growth. Each monthly meeting topic comes from the specific needs of the cohort. Past workshops have included Cooperative Learning strategies, Multiple Learning Styles, Stress Management, Time Management, Study Skill Techniques, and Self-Esteem for Educators.

The induction process fosters a strong sense of community throughout. New staff members receive the TIPS (Teacher Induction Program Stuff) newsletter three times each year with information about teaching strategies, cooperative learning, district information, and a bio highlighting a new teacher each issue. Similar to the CT BEST program, recommendation for tenure is conditional upon successful completion of the three-year program that also includes a required portfolio component. Each portfolio must include evidence of professional growth and student exemplars. At the end of the year, after the Board of Education has approved tenure for eligible teachers, a multi media celebration occurs. Members of the Board of Education,

administrators, and staff attend. Each newly tenured teacher is showcased and receives a copy of the poster "That Noble Title Teacher" and each becomes a valued member of the Islip family.

Data obtained via email from the current Assistant Superintendent supports the claims in the literature that Islip is an effective induction program. A New York City Council Investigation Division report from 2004 (p. 2) cited attrition rates in New York City at 18% on average. Only slightly higher than the national average, but still 42% higher than the weighted average attrition rate of the Islip program over the last 10 years. The ability to lower attrition rates by 30% or more each year over the last ten years is a substantial accomplishment. Assuming a constant rate of attrition enables the computation of two year (76.2%) and five year (50.7%) retention rates with simple exponential projection. These rates might not seem impressive on the surface, but they are an improvement over the non-induction rates (67.2% and 37.1% respectively) in the area.

Lafourche Parish Public Schools (FIRST) Program. Located in South Louisiana, the Lafourche (pronounced la-FOOSH) Parish Public Schools serve about 15,000 students in 30 schools, with approximately 2,300 employees. The Lafourche Parish Public Schools instituted the Framework for Inducting, Retaining, and Supporting Teachers (FIRST) program in 1996 with three simple goals:

- Reducing the intensity of the transition into teaching
- Improving teacher effectiveness
- Increasing the retention rate of highly qualified teachers

Lafourche hires roughly 40 new teachers every August to fill positions in its 27 schools. The FIRST program is three years long and consists of a highly structured four-day training session in early August before school starts and a one-day induction review seminar in April where the

new teachers can share their experiences and receive additional training. Each school site pairs a new teacher with a mentor teacher who can offer guidance and assistance during the first two years of teaching. The mentoring component is state-funded, and mentors receive payment for their services. They also receive three days of intensive training conducted by the curriculum coordinators and they continue to receive ongoing training throughout their tenure. Each school selects their mentor teachers for their excellence in teaching, and they consider the particular needs, grade level, assignment, and classroom location of each new teacher when matching mentors with new teachers. As with most effective programs, the mentor component is a large part of the FIRST program's success.

The mentors conduct informal observations of the new teachers as a way to provide specific, immediate, and nonthreatening feedback on their teaching skills. The mentors, district curriculum coordinators, and site-based instructional facilitators all collaborate together with the new teacher to develop individualized improvement plans based upon the new teachers' current teaching skills. The instructional facilitators provide many of the necessary aspects of the induction program that other programs relegate to their mentors, but the mentors in this program have classrooms of their own and they cannot always provide immediate assistance and feedback. The instructional facilitators receive training from the school system, and they "spend their days in classrooms conducting demonstration lessons, observing and providing feedback, assisting teachers in setting up classroom management plans, and lending their ears, shoulders, and expertise to new teachers" (Breaux & Wong, 2003, p. 83). The facilitators attend monthly support group meetings conducted by the district. Afterwards, they return to their schools and host monthly meetings for the new teachers as well as providing ongoing training for their entire

staff. New teachers also attend monthly district-level group meetings where they can share their experiences, voice concerns, and cooperatively seek solutions to problems.

The curriculum coordinators and instructional facilitators continue to work closely with the new teachers during the second and third years of the induction process. The informal classroom observations continue while second and third year teachers receive further training in classroom management, authentic assessment, Louisiana components of effective teaching, high-stakes testing, instructional strategies, positive discipline techniques, and instructional decision-making during four half-day sessions. Participants receive stipends to attend the seminars where they can pose questions, voice concerns, seek solutions to common classroom problems, and share personal classroom experiences. The Prescriptive In-service Program is another means of support for the new teachers where veteran teachers provide monthly in-service training for participants while conducting ongoing, informal prescriptive observations with feedback. The FIRST program provides new teachers with experienced mentors and other guides that provide them with the things that most new teachers desire: a collaborative and supportive atmosphere, a chance to observe good teaching practices and be observed with feedback, a support group of other new teachers that provides a sense of community, and individualized, long-term professional development.

Before the inception of the program, the Lafourche Parish school system typically suffered from a 51% average annual attrition rate. They based their program on the highly successful Flowing Wells School District Teacher Induction Program (TIPS), and their results are even better than the TIPS program. Immediately after the implementation of the induction program, the average attrition rate fell to 15%. The average retention rate over the first six years of the induction program was 9%. That represents an 81.7% reduction in attrition and a

normalized yearly retention rate of 97.3%. Figure 4 shows the new teacher attrition rates in the Lafourche Parish public schools from 1993 to 2002. Simple exponential projection provided the two year (82.8%) and five year (62.4%) retention rates.

Montana Beginning Teacher Support Program (BTSP). The purpose of the pilot program was to study the effects of mentoring first year teachers by looking closely at the relationships between the mentors and mentees. The three-year study occurred from July 1992 through July 1995 with a model that "views the mentor as the most significant facilitator in the new teacher's first year of growth…Because of mentoring, the speed and quality of beginning teacher's professional development are hypothesized to be superior to that of 'sink or swim' induction" (Spuhler & Zetler, 1995, p. 5). The study had the benefit of a control group for two of the three years, but it had the deficit of very small sample sizes, which severely limits the ability to generalize the results. Even though the results might not be statistically significant due to the small sample sizes, there does seem to be noticeable differences between the attrition rates of those who received mentoring and those who did not. Ten of the 11 original mentees (91%) were still teaching after three years, which is far better than the national average of 66%. Their average retention rate after one year (N = 35) was 94%, and it was 83% (N = 23) after two years if you do not count the two mentees who were unemployed and looking for teaching work. In fact, if you count those who were trying to find teaching work (N = 2) and those who went to graduate school (N = 2), the program had a 100% retention rate for all three cohorts over the entire three-year span. See Table 6 for a complete description of the retention rates. The results reported in Table 4 only counted those who were still teaching in the same district as Stayers. Those teaching in other districts or not teaching at all counted towards attrition. It seemed fair to ignore those who were seeking employment because it was unclear why they were unemployed

and if they intended to return to the same district or not. Similarly, this study ignored those attending graduate school because it was unclear why they chose to leave (i.e., did a bad experience force them to make a change, or did their experience inspire them to make a change?) With those individuals factored out of the numbers, 30 out of 33 mentees remained after one year while only 14 out of 17 of the control group remained. After two years, 13 of 19 mentees remained and six of nine control group teachers. There was no control group for the third year stats, but seven of the 10 mentees remained in teaching after three years. Using these values, the computed weighted averages for years one through three were 90.9%, 68.4%, and 70% respectively. After regression, the year five rate was 50.6%. By looking at the control group's yearly retention rate of 82.4%, it was possible to calculate a 48.3% reduction in attrition rates for the mentee groups. This translates to a normalized yearly rate of 92.2% when compared to the national average.

Oconee County Teacher Induction Program (TIP). The Oconee County School system, located in central Georgia, serves approximately 6,500 students in 10 schools. The TIP program began in 2001 when first and second year teachers working in the district received direct assistance from mentors and one induction specialist. The program now provides "support services to beginning teachers and their mentors through many activities such as TIP Week, model classrooms, demonstration classrooms, seminars, collaborative planning, and peer observations" (Villani, 2009, p. 45). Like so many other programs, the goals of the Oconee TIP program are to:

- Develop quality teachers to increase student achievement
- Increase the retention of promising beginning teachers
- Transmit the culture of the school system to newly hired teachers

- Provide support for inductees, their mentors, and the principals

New teachers attend a five-day program before school begins that includes model classrooms, training on differentiated instruction, classroom management, and information on legal mandates. Coaches conduct practice teacher evaluations to prepare new teachers for their formal observations, and schools provide monthly seminars on important classroom issues. A classroom management seminar occurs in October, and coaches visit classrooms regularly. Unlike other programs, experienced teachers (two or more years) who are new to the district are not eligible for this program.

Even though the program is limited to just those teachers new to the district with less than two years of teaching experience, it still services approximately a dozen teachers annually. Like so many other programs, the smaller group sizes and lack of control group makes it difficult to generalize the retention rate results or attribute all of the success to the program. Regardless of the limitations of the results, the retention rates are impressive. Over an eight-year span from 2001 to 2008, the program retained 99 of the 118 new hires (84%) in their district. Only four teachers (3%) left teaching altogether. See Table 7 for a more detailed description of the TIP program retention rates. Since the data were gathered in the middle of the 2007-08 school year, they were regressed using half-year designations for each cohort. This resulted in rates of 96.3%, 89.7%, and 72.6% with r = -0.8539.

Rochester Career in Teaching Plan. The Rochester City School District, located midway between Syracuse and Buffalo in Western New York, serves 32,000 students in 58 schools. The district created an induction plan in 1987 that they modeled after the Peer Assistance and Review (PAR) program in Toledo, Ohio. The goals of the program are to:

- Cultivate good teaching

- Create the best possible teaching staff
- Retain good quality teachers

They classify each new teacher as an "intern" on the Rochester City School District career level chart, and they assign them a mentor. The mentor works closely with the intern throughout the first year providing coaching and demonstration lessons. A major difference in this program is the use of mentors as evaluators. Mentors observe the interns, write reports on their performance, and ultimately make recommendations to the Career in Teaching (CIT) panel about their continued employment. Most experts believe that evaluation should be separate from the mentors in order to allow the mentors to bond more closely with their mentees and allow for open and honest dialogue between them. "Districts like Rochester…have incorporated National Board standards and processes, including teacher portfolios and peer coaching, as part of their teacher evaluation systems. All these strategies help to create a coherent continuum of professional learning based on common professional standards" (NCTAF, 1996, p. 74).

The program appears to have a positive impact on teacher retention rates. Prior to the inception of the program in 1987, only 65% of new teachers remained in the district. The first year after the program started, the retention rate dramatically increased to 91%. The average retention rate has been 88% over the last 24 years. That size of an increase over that long of a time span provides evidence to support the effectiveness of this program, and implies a 65.7% reduction in attrition potentially attributed to the induction program. This equates to a retention rate of 94.9% when normalized against the national average. A simple exponential projection yields two and five year rates of 77.4% and 52.8% respectively. A similar program in Cincinnati has a retention rate that is close to 95% annually. Since one of the program goals is to retain *good quality* teachers, it is no surprise that Rochester now asks more probationary teachers

(roughly 8%) to leave. “The career steps—intern, resident, career teacher, and lead teacher—provide supports for learning, evaluation based on professional standards, and salary incentives” (NCTAF, 1996, p. 97). This type of PAR program links career and salary advancement to performance, which has become more popular in the last decade.

South Texas School Districts. A study published in 2000 by Joseph Eberhard, Patricia Reinhardt-Mondragon, and Bobbi Stottlemyer investigated the effects of mentoring on the likelihood of retention of teachers in their first three years of teaching. They examined the effectiveness of campus-based mentor programs as well as the availability of pre-service training and university-based induction programs in Region 2 of South Texas, an area with historically high attrition rates. Of the 42 school districts in Region 2, only 25 participated. Each school received surveys to disseminate to any teacher with three or fewer years of experience. They did not provide details on how many teachers fit this category, but 228 teachers returned the surveys anonymously. The short 15-question survey asked participants for details on their demographics, certification, career choices, and job satisfaction. Additionally, the survey asked if they had a mentor teacher during induction and if so how much time they spent per week working with them. Lastly, the participants had three response choices to the question “How long do you plan to remain in teaching?” The researchers coded both the response “I definitely plan to leave teaching as soon as I can” and the response “I will probably continue teaching unless something better comes along” as an intention to leave teaching because they felt that if a respondent was waiting for something better to come along, then they were likely to leave the teaching profession. They coded “I plan to continue teaching” as the only response indicating an intention to continue teaching.

The study found a positive relationship with mentoring programs, but the effects diminished as the teachers' years of experience increased. Of the first-year teachers with a mentor, 90% expressed an intention to continue teaching while only 61% of the first-year teachers without a mentor expressed an intention to continue teaching. By the third year of teaching, the responses were almost identical. Their results suggest that having a mentor helps get teachers through the first two years of teaching, but after that, other factors may influence their decisions to stay or leave. See Table 8 for the details on the effectiveness of the mentor program broken down by years of teaching experience. Overall, 83% of all teachers having a mentor program intended to continue teaching while only 66% of those without a mentor program intended to stay. Additionally, if they met with their mentors for more than one hour per week, their retention rate rose to 90%. See Table 9 for the details on the effects of hours spent per week with their mentor. The researchers concluded that a critical component of the induction program is the use of a mentor teacher. “The research indicates that mentors are important to facilitating the integration of the new teacher into the school culture as well as developing coping strategies in response to the stresses related to the problematic aspects of teaching” (Eberhard, Reinhardt-Mondragon, & Stottlemyer, 2000, p. 37).

In order to calculate the retention rates for Table 4, the raw numbers of respondents in Tables 8 and 9 on pages 49 and 50 of the Eberhard paper were used. According to the data, 113 of the 127 participants (89%) that had a mentor or model teacher planned to continue teaching while only 41 of the 69 teachers (59.4%) who did not have mentors or model teachers stated that they planned to continue teaching. After two years it was 47 out of 63 (74.6%) versus 28 out of 46 (60.9%), and for three years it was 53 of 72 (73.6%) versus 41 of 57 (71.9%).By comparison, the new teachers with mentors or model teachers stated they planned to leave teaching 72.9%

less than those who did not have a mentor or model teacher. This would equate to a yearly retention rate of 95.9% when compared to the national average.

Common Components of Effective Programs

A majority of the sources reviewed listed components of effective induction programs. Some themes have emerged from the literature about which components may matter most or are most common to include in induction programs. Of the 52 sources that recommended induction components, all 52 suggested the use of experienced mentors, and most also explicitly stated that the mentor should be in the same subject and/or grade level as the mentee. Sixty percent of the sources suggested providing new teachers with common planning time with their mentor and/or other new teachers. Sometimes, sources cited this theme more generally as "collaboration with other teachers." Another theme on most lists (58%) was sustained, structured, self-guided professional development. Half of the sources listed support from the administration or principal. Observing good teaching (23%) and being observed while teaching (22%) appeared separately in lists, but not surprisingly in almost perfect pairs. Similarly, release time and reduced teaching loads were paired up on many lists (31% and 29%, respectively). The nine most commonly listed components with frequencies and percentages are in Table 10.

Knowledgeable Mentors in the Same Subject Area and/or Grade. The most common theme among the literature was the use of an experienced mentor in the teacher's own subject area or grade. All of the sources reviewed cited it as an essential characteristic in any effective induction program. "Mentoring is the most common element of induction programs and has been shown to be a major contributing factor in keeping new teachers in the profession" (Arnold-Rogers et al., 2008, p. 19). Winstead Fry suggests "assign[ing] new teachers caring and capable mentors who have a common planning period, and teach at the same grade level and content

area" (2007, p. 233). The Berry et al. report also suggests that an effective program should "focus on [new teachers] learning alongside an experienced, trained mentor" (2008, p. 5). Not every source stipulated that the mentor needed to be in the same subject area and grade level as the mentee, but many mentioned it as being vital. Due to its perceived importance, the U.S. Department of Education added new and expanded items starting on the 1999-2000 Schools and Staffing Survey (SASS) asking if beginning teachers had a mentor, and whether the mentor was in their same subject area or not. According to a study by Ingersoll and Kralik, "having a mentor in the same field reduced the risk of leaving at the end of the first year by about 30%" (2004, p. 12). Having a mentor outside of their subject area only reduced the risk of leaving by 18%. Some form of mentoring was present in every one of the effective programs listed in this study, and they all indicated that having the mentor in the same subject area and/or grade level was a key component. Additionally, most programs kept their mentees in rooms close to the mentors to facilitate easy access and frequent visits.

Collaboration/Sense of Community. Collaboration with other teachers involved activities like common planning times or meetings with colleagues to discuss lesson plans and other classroom topics. A report by Berry et al. for the Aspen Institute and the Center for Teacher Quality recommends that induction programs should "group candidates in cohorts to cultivate a professional learning community and foster collaboration" (2008, p. 5). Winstead Fry suggests, "assign[ing] new teachers to classrooms that keep them near their teaching teammates to facilitate collaboration and support" (2007, p. 233). According to Smith and Ingersoll's findings, collaboration had a strong impact on reducing attrition rates.

> Having common planning time with other teachers in their subject area or participating in regularly scheduled collaboration with other teachers on issues of instruction (Model 4)

> reduced the risk of leaving, as opposed to staying, by about 43% ($r = 0.572$, $p < 0.000$) and the risk of moving, as opposed to staying, by 25% ($r = 0.749$, $p = 0.108$). (2004, p. 703)

Even though the effect of moving was not significant at the 90% confidence level, it was quite close. A similar characteristic that a number of sources listed was a sense of community or making sure that the new teacher felt like they belonged. "A major role of the trainers is to immerse the new teachers in the district's culture and to unite them with everyone in the district in order to form a cohesive, supportive instructional team" (Wong, 2001, p. 2). Morgan and Kritsonis suggest, "new teachers should always be given a great amount of fanfare upon arrival to a campus" (2008, p. 3). There was a strong correlation between collaboration and a sense of community in Smith and Ingersoll's results, so this could make collaboration even more effective than their initial statistics would indicate. Sixty percent of the sources cited collaboration as being essential.

Individualized Professional Development. Fifty eight percent of the sources reviewed agree that some form of regular professional development was helpful for new teachers and had positive effects on reducing attrition rates.

> What keeps good teachers teaching is structured, sustained, intensive professional development programs that allow new teachers to observe others, to be observed by others, and to be part of networks or study groups where all teachers share together, grow together, and learn to respect each other's work. (Wong, 2004, p. 52)

Most sources also agreed on an addendum that the teachers have some say in the content of the seminars and classes. The teachers needed to feel in charge of their learning and they needed the

ability to tailor the subjects to areas that helped them most. Some of the more common topics that new teachers expressed as ones they wanted in their professional development courses were:

- Teaching methods
- Curriculum content
- Classroom management
- Advice to students
- School policies

A report by (Smith & Ingersoll, 2004) found that having seminars or classes for beginning teachers was associated with a small and statistically insignificant reduction in attrition. In addition to mentoring and professional development, every effective program examined in this study contained a strong commitment to collaboration and teamwork among its teachers.

Support from Principal/Administration. Half of the sources that listed induction components suggested the need for strong support from the principal or administration. "More than any other person in a school, the principal is the one who sets the tone of how easily or difficult it is for novice teachers to be accepted into the school learning community" (Wood & Stanulis, 2009, p. 12). Ingersoll and Kralik (2004, p. 12) found that new teachers who experienced an induction package that included regular or supportive communication with their principal or other administrators had a statistically lower probability of leaving the teaching profession. "Beginning teachers reported that the principal is a key source of support and guidance" (Brock & Grady, 1996, August, p. 14). New teachers often express a desire for more support from their administrators in surveys, and numerous research studies have acknowledged the importance of support from those supervising the new teachers.

Observations. Another major theme from the literature is the need for more opportunities for new teachers to observe good teaching as well as being observed and evaluated by others. "Mentors should be allowed time to observe the novice, [and] it is also beneficial to arrange for the novice teacher to observe his or her mentor as well as other teachers throughout the school" (Arnold-Rogers et al., 2008, p. 19). Hollander and Scharff found that "new teachers at Hunter [College High School] want support, specifically, the opportunities to observe other teachers and to be observed" (2002, p. 12). When new teachers responded to surveys about what they desire most out of an induction program, a desire to observe and be observed was cited in every survey found in the review of the literature. New teachers yearn for the opportunity to watch mentors or other veteran teachers in a classroom presenting a lesson. Some programs even have "demonstration rooms" specifically suited for this opportunity. These classrooms also allow new teachers to present a lesson themselves while having the mentors or coaches evaluate their performance and offer feedback and suggestions for improvement. Almost half (42-44%) of the sources reviewed cited this characteristic.

Release Time/Reduced Teaching Load. Originally, this study evaluated these two components independently of one another by keeping track of when each one was mentioned in the literature. It turns out that the two ideas were listed concurrently in almost every one of the sources that cited one of them, so it would appear that they are considered very similar in the literature. As shown in Table 10, reduced teaching load was in 15 sources while release time was in 16 sources with an overlap of 12 sources. Figure 3 presents the overlap between release time and reduced teaching load in a Venn diagram. Seventy five percent of the release time sources overlapped and 80% of the reduced teaching load sources overlapped. Overall, there were 19 distinct sources citing one or both of these components with 12 (63%) mentioning both

explicitly. Upon closer examination, four of the remaining seven sources had language broad enough to imply the other characteristic as well. For instance, the following quote from Ganser was coded as release time. "At a minimum, beginning teachers and mentors need time together, both to be in one another's classroom and to meet together. Being able to attend a professional development activity or workshop together is also a plus" (1995, April, p. 4). However, a new teacher with a reduced teaching load would also have more time to attend workshops and meet with their mentor. Similarly, "time to participate in activities" was coded as release time, but one could easily make the argument for reduced teaching load as well. After combining the two components, there are 19 distinct citations in the 52 sources, which would keep it in 7th place with 37%.

Networking. Networking with outside sources had mixed results in Smith and Ingersoll's study, and only 25% of the sources reviewed listed it as a necessary characteristic. According to Smith and Ingersoll, it reduced the likelihood of leaving, but it increased the risk of moving. They theorized that the teachers' exposure to people outside their school increases their chances of hearing about other job opportunities, but moving is better than leaving since they are still teaching. According to one study, "Participation in an external network of teachers (e.g., one organized by an outside agency or over the Internet) reduced the likelihood of leaving by about 44%, at a statistically significant level" (Ingersoll & Kralik, 2004, p. 12). Examples of networking included informal things like internet forums as well as more formal ideas like seminars and university coursework.

According to Smith and Ingersoll (2004), the rest of the components in Table 10 were either statistically insignificant in their effect on lowering attrition rates, or Ingersoll and Smith failed to analyze them at all in their study. Those that Smith and Ingersoll did analyze showed

effects in the proper direction, and some were close to being significant at the 90% confidence level. Since so many induction programs offer different combinations of these components, Smith and Ingersoll analyzed combinations of components. The study found that the most cost-effective combination was an experienced mentor in their subject area, common planning time with their mentor, and collaboration with other teachers on topics of instruction. This simple set of three items lowered the probability of leaving after the first year from 20% to 11.8%. A more complex package of six components only lowered the predicted probability of leaving to 11.6%, and the most comprehensive package of eight components lowered it to 7.1% (Smith & Ingersoll, 2004). If a school district can afford to implement all nine of the components on my list, it would likely reduce their attrition rate to around 7%, but it would be costly. By comparison, implementing the simple set of three components should cut attrition rates almost in half, and would cost almost nothing.

The Right Mentor is Key

Numerous studies have looked at the needs of new teachers, and although the needs of teachers can vary greatly from person to person, some trends have emerged. Gratch (1998, January) conducted a survey of beginning teachers and their mentor relationships, and participants in this study cited problems and concerns commonly found in studies of this kind. During the first two months of school, the teachers had concerns with classroom discipline and management, getting sufficient materials, organizing the classroom, dealing with parents, daily scheduling and planning, paperwork, motivating students, and meeting the needs of individual students. Arnold-Rogers et al. states that "new teachers report concerns over grading procedures, student behavior, lesson planning, isolation, time constraints, evaluation stresses, and instructional strategies" (2008, p. 19). The list of concerns is lengthy, but the literature agrees on

one thing: most problems can be alleviated or lessened with an induction program that includes a supportive and experienced mentor.

Researchers, administrators, policy makers, and teachers of all experience levels can agree on the importance of supervised induction programs for new teachers. "Well-designed induction programs can provide beginning teachers with support that helps them survive the classroom management challenges, seemingly endless curriculum and instruction questions, and feelings of isolation that contribute to the nationwide attrition problem" (Winstead Fry, 2007, p. 217). In a Metropolitan Life (1991) survey of teachers, when asked to reflect back on their first year of teaching and determine what would have helped them most, 46% felt that a skilled, experienced teacher assigned to provide advice and assistance would have been most helpful. A similar question was in the *MetLife Survey of the American Teacher, 2004-2005: Transitions and the Role of Supportive Relationships*. The survey asked teachers with five years or less experience, which one of the three components (more practical training, assigning a more experienced teacher as a mentor, or better training in working with students and families from diverse ethnic backgrounds) would have helped them the most during their first year. The new teachers ranked being assigned a more experienced teacher as a mentor (38%) the highest with more practical training, such as a year's internship (34%) a close second (Metropolitan Life, 2005). Administrators also believe in the power of mentoring. According to a 2006 Metropolitan Life survey, 83% of education deans/chairpersons believe that assigning mentors to new teachers is very important in fostering teachers who are satisfied with their careers. Administrators realize that teachers are important resources for each other, and they realize this by how often new teachers meet with mentors or experienced teachers to discuss issues. According to a 2008

MetLife survey, nearly two-thirds (63%) of teachers meet with a more experienced teacher at least once a month to discuss classroom issues.

Effective induction programs that include mentoring can reduce feelings of isolation and confusion for new teachers. Numerous studies have shown possible links between mentoring and a reduction in attrition rates (AEE, 2005; Arends & Rigazio-DiGilio, 2000, July; Arnold-Rogers et al., 2008; Berry et al., 2008; Breaux & Wong, 2003; Brock & Grady, 1996, August; CCTC, 1992; Colbert & Wolff, 1992; CSDE, 2008; Curran & Goldrick, 2002; Darling-Hammond (ed.), 1994; Davis & Field Waite, Fall, 2006; Eberhard et al., 2000; Ganser, 1995, April; Gratch, 1998, January; Hollander & Scharff, 2002; Huling-Austin & Murphy, 1987, April; Ingersoll & Kralik, 2004; Kaiser, 2011; McNeil et al., 2006, November; Metropolitan Life, 1991, 2005, 2006, 2008; NCTAF, 1996, 2007; Odell & Ferraro, 1992; Quinn & D-Amato Andrews, 2004; Smith & Ingersoll, 2004; Smylie, 1994; Spuhler & Zetler, 1995; Strong, 2009; Villani, 2009; Wong, 2001, 2004; Wood & Stanulis, 2009). Ingersoll and Kralik conducted one of the most thorough reviews of the literature on the effects of induction on retention rates. After looking at over 150 empirical studies, they chose 10 that all had quantitative data, evaluations of effects based upon well-defined and verifiable outcomes, and a comparison or control group. Even though the impact of the induction and mentoring differed significantly among the 10 studies reviewed, they concluded that "collectively the studies do provide empirical support for the claim that assistance for new teachers and, in particular, mentoring programs have a positive impact on teachers and their retention" (2004, p. 2). MetLife ran logistical regression on their 2006 survey data and determined that having a mentor in the first year of teaching significantly increases the likelihood that a teacher will remain in the profession. According to their data, 50% of the teachers who planned to stay in teaching had a mentor during their first year, compared to only 29% of those

who planned to leave. Although it is difficult to control for so many other factors when analyzing the effects of mentoring on retention, the research does support the claim that well-designed induction programs that include a mentor in the same subject area or grade level contribute to higher retention rates.

Many of the same researchers have found links between teachers who are mentored and increases in teacher effectiveness in their early years (Darling-Hammond, Gendler, & Wise, 1990; Darling-Hammond (ed.), 1994; Davis & Field Waite, Fall, 2006; Huling-Austin (Ed.), 1989; Metropolitan Life, 2005, 2006, 2008; NCTAF, 1996, 2003, 2007; Smylie, 1994; U.S. Department of Education, 1999; Wong, 2001, 2004). According to a report completed by the NCTAF, "beginning teachers who receive mentoring focus on student learning much sooner; they become more effective as teachers because they are learning from guided practice rather than trial-and-error; and they leave teaching at much lower rates" (1996, p. 40). According to the MetLife survey in 2006, 89% of teachers surveyed agreed that mentor teacher programs help to improve the teaching skills of new teachers. Conversely, those who did not have mentors, or those having ineffective mentors felt disadvantaged and unsupported. "I was not assigned a mentor…I did not get any assistance from the other teachers at school. This made my first year teaching very confusing, isolating, and exhausting" (Jenny C., Former Teacher, as cited in Metropolitan Life, 2006, p. 38). A report by the U.S. Department of Education National Center for Educational Statistics (1999) stated that 70% of teachers who were mentored at least once a week reported that it improved their teaching "a lot."

Since teacher effectiveness is determined to be an important predictor of student success, and induction has been shown to help improve teaching practice, the need to continue the

> education of novice teachers in the first years of teaching through comprehensive induction programs is greater than ever. (Davis & Field Waite, Fall, 2006, p. 1)

Summary

The literature cites numerous different programs and program components as being effective at lowering new teacher attrition rates. Some of these components are skilled mentors with experience in the same subject and grade level as the new teacher, ongoing professional development beyond the first year of teaching, collaborating with other teachers in the same subject and grade level, a strong sense of support from the school administrators, and opportunities to observe good teaching practices and in turn be observed teaching. A study by Odell and Ferraro found mentoring to be the most common element of induction programs, and their study made "plausible the suggestion that teacher mentoring can reduce the early attrition of beginning teachers from the profession" (1992, p. 203).

The content, duration, and delivery of induction vary so much from one program to another that it is not possible to make general conclusions about the impact of mentoring and induction on new teacher retention rates from any given study. A majority of studies are program evaluations that collected data on outcomes solely from those who had participated in the particular programs being assessed (e.g., Arnold-Rogers et al., 2008; Berry et al., 2008; Breaux & Wong, 2003; Brock & Grady, 1996, August; Cherubini, 2007; Colbert & Wolff, 1992; Davis & Field Waite, Fall, 2006; Glassford & Salinitri, 2007; Huling-Austin & Murphy, 1987, April; Odell & Ferraro, 1992; Quinn & D'Amato Andrews, 2004; Spuhler & Zetler, 1995; Strong, 2009; Villani, 2009; Winstead Fry, 2007; Wong, 2003, 2004). Such studies can provide valuable feedback to both program designers and providers, but unless a study collects empirical data from both participants and nonparticipants in a program, it cannot provide unambiguous

conclusions about the effectiveness (or ineffectiveness) of that induction program to lower new teacher attrition rates.

"What is not needed, however, are more studies that do not involve the kind of careful control that would allow unambiguous conclusions about the particular value added by the program component being considered" (Ingersoll & Kralik, 2004, p. 15). Instead, this study will utilize data from a representative national sample of nearly 2000 new public school teachers to analyze the impacts of various induction program components when compared to those teachers who did not have said induction components.

Chapter 3

Methodology

Introduction

In order to create a rich and multidimensional understanding of what makes a new teacher induction program effective, this study first determined what components are common among effective new teacher induction programs by looking at existing programs and their success rates at reducing new teacher attrition (Tables 4 and 10). Research questions were answered with a mixed methods design. Ridenour and Newman say, "One can mix methods to address different components of the same study" (2004, October, p. 11). This will allow one method to inform the other. A mixed methods design was appropriate because of the various aspects (both qualitative and quantitative) of the various research questions answered. This type of design allowed for analyses of the effects of various induction programs on teacher attrition rates as well as the "perceived effectiveness" of various program components based upon the opinions of the teachers and administrators. The data were both quantitative and qualitative in nature.

IRB Approval

IRB approval for obtainment and usage of the National Center for Education Statistics' Teacher Follow-Up Survey, Schools and Staffing Survey, and Beginning Teacher Longitudinal Study datasets was obtained from both the University of Arkansas and NCES for use in this study. After datasets were extracted and merged, all identifying details were removed in order to protect the identities of all respondents.

Research Design

This study is an ex post facto quantitative study using data from various surveys conducted by the NCES. According to Kirk (1995),

> The term ex post facto study (after-the-fact study) refers to any nonexperimental research strategy in which subjects are singled out because they have already been exposed to a particular condition or because they exhibit a particular characteristic. In such studies, the researcher does not manipulate the independent variable or assign the subjects to the experimental conditions. (p. 9)

Since a third party organization (NCES) gathered the data, it was not possible to randomize subjects nor was it possible to control for any of the independent variables. Nor did the researcher have control over which teachers participated in induction programs and which did not. In addition, there was no control over what components the induction programs contained or how they were implemented. This overall lack of ability to manipulate the independent variables is why this study is classified as an ex post facto research design.

Instrument

The data used to analyze the hypotheses came from three NCES databases. NCES is the primary federal entity mandated by Congress to collect, collate, analyze, and report full and complete statistics related to education in the United States. In the mid-1980's, NCES conducted various surveys concerning schools and school personnel. The data used for analysis in this study came from the 2007-08 Schools and Staffing Survey (SASS), the 2008-09 Teacher Follow-up Survey (TFS), and the first three waves of the 2007-08 Beginning Teacher Longitudinal Study (BTLS).

Schools and Staffing Survey (SASS). In order to fulfill an increasing need for studies that would provide national data on public and private schools and their programs, teachers, and staffing levels, the NCES began developing and administering a number of separate surveys concerning schools and school personnel in 1983. In 1986, after identifying gaps in content and design, they redesigned the SASS survey system to emphasize teacher demand and shortages along with the components of the schools, administrators, and teachers. After the 1987–88 administration of SASS, the survey was conducted again in 1990–91, 1993–94, 1999– 2000, 2003–04, and 2007-08. "From its inception, SASS has had four core components: the School Questionnaire, the Teacher Questionnaire, the Principal Questionnaire, and the School District Questionnaire, which was known as the Teacher Demand and Shortage Questionnaire until the 1999–2000 SASS administration" (U.S. Department of Education, National Center for Education Statistics, 2011b, p. 1). Respondents in public, private, and Bureau of Indian Education/tribal schools receive these surveys. Public charter schools were added to the sample in 1999-2000. For the 2003–04 and 2007–08 SASS, the public charter schools no longer received their own separate surveys due to lack of funds. Instead, a sample of public charter schools is included in the sample as part of the public school questionnaire (Tourkin, et al., 2010). In order to allow researchers to investigate trends over time, many of the same survey questions are in each cross-sectional cycle of the survey. "SASS is the largest, most extensive survey of K–12 school districts, schools, teachers, and administrators in the United States today" (Graham, Parmer, Chambers, Tourkin, & Lyter, 2011, p. 1). It provides valuable and extensive data on the components and qualifications of teachers and principals, teacher hiring practices and professional development, and other conditions in schools across the nation.

Teacher Follow-up Survey (TFS). The TFS is a database of follow-up survey questions that provided further insight into induction program successes and failures. The purpose of the TFS is to determine how many teachers stayed at the same school (Stayers), moved to another school (Movers), or left the profession (Leavers) the year after each SASS administration. Thus, the 2008-09 TFS was administered to a sample of teachers who completed the 2007-08 SASS. The 2008-09 TFS is different from any previous TFS administration in that it also serves as the second wave of the Beginning Teacher Longitudinal Study. Because of this, the 2008-09 TFS consisted of two questionnaires for respondents who were first-year public school teachers in the 2007-08 SASS and two other questionnaires for the remainder of the sample. Stayers and Movers receive the Current Teacher questionnaire with topics that include "teaching status and assignments, ratings of various aspects of teaching, information on decisions to change schools, and ratings of various strategies for retaining more teachers" (U.S. Department of Education, National Center for Education Statistics, 2011c, p. 1). The Leavers receive the Former Teacher questionnaire with topics that include "employment status, ratings of various aspects of teaching and their current jobs, and information on decisions to leave teaching" (U.S. Department of Education, National Center for Education Statistics, 2011c, p. 1). The major objectives of the 2008–09 TFS were to measure teacher attrition rates, examine the characteristics of Stayers, Movers, Leavers and retirees, obtain activity or occupational data for Leavers, obtain reasons for moving to a new school or leaving the K–12 teaching profession, and collect data on job satisfaction (Graham et al., 2011).

Beginning Teacher Longitudinal Study (BTLS). The BTLS follows a cohort of beginning public school teachers initially interviewed as part of the 2007-08 schools and staffing

survey. According to the NCES (Beginning Teacher Longitudinal Study (BTLS), 2011a) website, the BTLS strives to answer questions such as:

- Are beginning teachers who received formal mentoring from their school or district less likely to leave the profession or change schools in the first few years of their teaching career?
- Why do teachers leave the teaching profession and which factors have a greater importance at various stages in teachers' careers and lives?

Data were collected in the 2007–08, 2008–09, and 2009–10 school years and were released as the BTLS First through Third Wave Preliminary Data File. The BTLS is expected to continue for at least five waves. The first wave of BTLS data came from select questions in the 2007–08 SASS, which began in August 2007 and ended in June 2008. The approximately 1,990 (unweighted) first-year public school teachers who completed the 2007–08 SASS comprise the cohort being followed in the BTLS. Data for the second wave was gathered from the 2008–09 TFS, which began in February 2009 and ended in August 2009. Data collection for the third wave began in January 2010 and ended in June 2010. "Although each collection contained a telephone follow-up, the information was collected primarily through a mailed paper questionnaire for the first wave and a web instrument for the second and third waves" (Kaiser, 2011, p. 1).

Sampling Frames and Sample Selection

Other than basic descriptive statistics, all of the data used for this study came from the BTLS database. Teachers sampled for the BTLS are part of the SASS teacher sample, which is based on the SASS school sample. Because SASS and BTLS are so interrelated, it is logical to describe the sampling frames and sample selection of both SASS and BTLS.

SASS Public Schools. The 2007–08 SASS public school frame was based upon the preliminary 2005–06 Common Core of Data (CCD) Nonfiscal School Universe Data File. The CCD includes standard and non-standard schools (special education, alternative, vocational, or technical), public charter schools, and Bureau of Indian Education (BIE) schools. Due to concerns over loss of anonymity due to their small sample size, teachers from BIE schools were not included in the BTLS. In order to fit the definition of a school that was eligible for SASS, the sampling frame was adjusted from the CCD. For SASS, a school was defined as an institution, or part of an institution, that provides classroom instruction to students; has one or more teachers to provide instruction; serves students in one or more of grades 1–12 or the ungraded equivalent; and is located in one or more buildings apart from a private home (Kaiser, 2011). The SASS public school sampling frame consisted of 90,410 traditional public schools and 3,850 public charter schools.

The SASS sample is a stratified probability proportionate to size (PPS) sample. All schools underwent multiple levels of stratification so that national, regional, and state-level elementary and secondary school estimates and national-level combined public school estimates could be made. The sample was allocated to each state by school type (traditional public, public charter, BIE-funded, and schools with high–American Indian enrollment) and grade range (elementary, secondary, and combined). For a full description of the allocation procedure, see Tourkin et al. (2010). NCES used a PPS algorithm to systematically select schools within each stratum. The square root of the number of full-time-equivalent teachers reported or imputed for each school during the sampling frame creation was used for the measure of size for the schools. Schools with an unusually high number of teachers relative to other schools in the same stratum were automatically included in the sample. The school with the highest probability of selection

was included in the sample by default whenever the sum of the probabilities of schools within a school district and grade level did not guarantee a sampled school for that school district. This guaranteed that all school districts would have at least one school in the sample. This produced a public school sample of 9,810 schools in the 2007–08 SASS (450 American Indian enrollment schools, 370 public charter schools, 20 career technical centers, and 8,970 other traditional public schools) (Kaiser, 2011).

SASS Teachers. SASS defines teachers as any staff member who teaches regularly scheduled classes to students in any of the grades K–12. The Census Bureau collected and compiled teacher rosters (i.e., Teacher Listing Forms) from sampled schools, primarily by mail, on an ongoing basis throughout the roster collection period. Along with the names of teachers, respondents at the sampled schools provided information about each teacher's teaching experience (1–3 years, 4–19 years, and 20 or more years), teaching status (full or part time), and subject matter taught (special education, general elementary, math, science, English/language arts, social studies, vocational/technical, or other), as well as whether the teacher planned to be teaching at the same school in the following year (Kaiser, 2011). This information was also gathered on an ongoing basis throughout the roster collection period.

> Schools were first allocated an overall number of teachers to be selected within each school stratum. The Census Bureau then stratified teachers into five teacher types within each sampled school: (1) new teachers expected to stay at their current school, (2) mid-career and highly experienced teachers expected to stay at their current school, (3) new teachers expected to leave their current school, (4) mid-career teachers expected to leave their current school, and (5) highly experienced teachers expected to leave their current school. (Kaiser, 2011, p. B4)

Sampling rates for teachers varied among the strata listed above, with all teachers in categories 3–5 oversampled at different rates. To avoid overburdening a school by sampling too large a proportion of its teachers, the maximum number of teachers per school was set at 20. About 13 percent of the eligible public schools did not provide teacher lists. No teachers were selected from the roughly 13% of eligible public schools that did not provide teacher lists. Teachers were selected systematically with equal probability within each teacher stratum in each school.

BTLS Teachers. All teachers from traditional public or public charter schools who reported their first year of teaching as being 2007 or 2008 on the SASS Teacher Questionnaire were included in the BTLS sample. The sample initially included about 2,100 teachers (rounded and unweighted). The sample was reduced to $N = 1992$ after subsequent survey responses indicated that some teachers were mistakenly categorized as new teachers.

Data Collection Procedures

The first wave of the BTLS data came from the 2007–08 SASS data for teachers who began teaching in 2007 or 2008. The first wave of data collection came primarily from mail-based questionnaires with telephone and field follow-ups used for nonrespondents. The Census Bureau attempted to establish a survey coordinator at each school. "The 2007–08 SASS included several questionnaire components, which collected data from schools, school districts, principals, library media centers (public and BIE-funded schools only), and teachers" (Kaiser, 2011, p. B5). The SASS teacher data collection began in August 2007 and ended in June 2008. For complete details regarding the SASS, refer to Tourkin et al. (2010).

During the 2008-09 school year, the Census Bureau conducted the second wave of BTLS together with the TFS. The BTLS teachers used the longitudinal versions (TFS-2L and TFS-3L) of the questionnaires, which contained more questions than the standard TFS questionnaires. The

second wave data primarily came from an internet instrument with paper questionnaires mailed out upon request. During the second wave data collection, it was discovered that 101 teachers mistakenly reported their first year of teaching as 2007–08 when they had actually begun teaching earlier than that. These cases were removed from the BTLS sample. Telephone follow-ups resolved the cases with this discrepancy, collected any missing data, and encouraged participation or collected data from nonrespondents. Paper questionnaires were mailed in June 2009 to all teachers having not yet completed the survey. The TFS data collection began in February 2009 and ended in August 2009. For more details regarding the TFS, refer to Graham et al. (2011).

The Census Bureau conducted the third wave of the BTLS during the 2009–10 school year. Current teachers (Stayers, Movers, and Returners) and former teachers (Leavers) all responded to the same internet questionnaire for the third wave of BTLS data collection. Skip patterns built into the internet instrument determined both their current/former and Stayer/Mover/Leaver/Returner statuses. Telephone follow-up efforts encouraged participation or collected BTLS data from nonrespondents. The Census Bureau later removed five additional cases after they determined the five cases had been misclassified as beginning teachers. Ultimately, the BTLS sample included 1,992 teachers (unweighted). The data collection period for the third wave began in January 2010 and ended in June 2010. All BTLS questionnaires are available on the BTLS website: (http://nces.ed.gov/surveys/btls/). For more details on data collection for the BTLS, refer to Tourkin et al. (forthcoming).

Data Processing and Imputation

The BTLS first wave data came from the Teacher Questionnaire (Form SASS-4A) during the 2007–08 SASS. The census Bureau captured the data from the completed questionnaires after

the completion of the BTLS first wave data collection. All BTLS first wave data processing occurred within the single SASS Teacher Questionnaire Data File. “The Census Bureau applied a series of computer edits to identify and fix inconsistencies and impute items that were still ‘not answered’ after taking into account item responses that were blank due to a questionnaire skip pattern” (Kaiser, 2011, p. B6). The Census Bureau created the BTLS First Wave Data File after the data underwent all stages of computer edits, imputation, and review.

Once the Census Bureau completed the second wave of the BTLS data collection, they electronically captured the data from completed paper questionnaires and combined them with data from the internet instrument. They conducted the data processing separately within each of the nine separate SASS questionnaires. Even though the SASS collected data from private, BIE and nonstandard school, the BTLS includes only teachers who taught in a public school (traditional or charter) in the 2007–08 school year; therefore, the only SASS questionnaire type of interest here is the Teacher Questionnaire. The census Bureau ran a series of computer edits on the data to “identify and correct inconsistencies, delete extraneous entries in situations where skip patterns were not followed correctly, or assign the ‘not answered’ code to items that should have been answered but were not” (Kaiser, 2011, p. B6). A final interview status code was then assigned to each case. Once the Census Bureau analysts reviewed all the data, they assigned a final interview status code to each case and created the edited BTLS Second Wave Data File in preparation for the next stage of data processing and imputation. For further details about the TFS, refer to Graham et al. (2011).

The Census Bureau processed the third wave of the BTLS data from completed internet instruments separately within each survey respondent type. A series of computer edits identified and corrected inconsistencies and deleted extraneous entries in situations where skip patterns

were not followed correctly or assigned the "not answered" code to items that should have been answered but were not. The Census Bureau created the edited BTLS Third Wave Data File in preparation for the next stage of data processing and imputation after it reviewed all of the data. The Census Bureau retrospectively added any missing data into the second wave data file whenever possible. "As a result, these retrospective respondents represent 8.1% of the weighted total of 2008–09 current teachers (11.3% of the Movers) and 8.6% of the weighted total of 2008–09 former teachers" (Kaiser, 2011, p. B7).

Once processing of the three waves was complete, the data from the first, second, and third waves of BTLS were put in one data file called the BTLS First Through Third Wave Preliminary Data File. This allowed for a cross-wave imputation as a final stage of data processing. Only a select set of items were imputed because they were identified as key or important for reporting or analysis. All other items are subject to missing data.

> The imputed data for selected items were removed from the first wave and then re-imputed on the basis of the case's responses to items from subsequent waves of the BTLS, whenever possible. If data were not available from subsequent waves, then the existing imputed value remained. For further details about the SASS, refer to Tourkin et al. (2010). Several variables in each BTLS wave were identified as "key variables," or important reporting or analytical variables, and were imputed (or re-imputed, in the case of the BTLS First Wave data) once the edited BTLS Second and Third Wave Data Files were created and fully reviewed. (Kaiser, 2011, p. B7)

The Census Bureau used two main approaches to fill "not answered" items with data during the imputation stage of processing on all three waves of the BTLS data. In one approach, called

"cross-wave imputation," they imputed data from the same case from either the preceding or the subsequent BTLS wave whenever possible.

> The second method of imputation is known as "weighted sequential hot deck imputation," during which data were imputed using items from other cases that had certain predetermined characteristics in common, while also keeping the means and distributions of the full set of data, including imputed values, consistent with those of the unimputed respondent data. Weighted sequential hot deck imputation was used for only the BTLS second and third wave data. (Kaiser, 2011, p. B7)

After the Census Bureau completed the imputation of the key variables, they combined the data from the three waves into one three-wave BTLS file for release. The data file is considered preliminary because they will weight it again after the data collection of the fourth wave is complete. For more details regarding data processing for BTLS, refer to Tourkin et al. (forthcoming).

Response Rates

Unit Response Rate. The unit response rate is defined as the rate at which the sampled units responded, and it can be calculated as unweighted or weighted. It was not known if a teacher was a first-year teacher prior to the collection of the SASS teacher data, only whether each teacher reported having 1 to 3 years of experience, 4 to 19 years, or 20 or more years of teaching experience. The response rates presented in this section represent those of the 2007–08 SASS public school teachers who reported having 1 to 3 years of experience, not just the first-year teachers included in the BTLS.

> The unweighted response rates are the number of 2007–08 SASS public school teachers reported to have 1 to 3 years of experience who substantially completed the questionnaire

> divided by the number of eligible (in-scope) sampled units, which include respondents plus nonrespondents but excludes ineligible (out-of-scope) units. The weighted response rates are the base-weighted number of cases that substantially completed the questionnaire divided by the base-weighted number of eligible cases. The base weight for each sampled unit is the initial basic weight multiplied by the sampling adjustment factor (Kaiser, 2011, p. B8).

Overall Response Rate. The overall response rate is the response rate to the survey after taking into consideration each stage of data collection. A teacher was eligible for the SASS only if the school completed the Teacher Listing Form during the 2007–08 SASS data collection. This form provided a sampling frame for teachers at that school.

> The overall response rate for the BTLS first wave is the product of the survey response rates: (SASS Teacher Listing Form response rate) x (SASS public school teachers with 1 to 3 years of experience response rate). The overall response rate(s) for the second and third waves are the product of three factors: (SASS Teacher Listing Form response rate) x (SASS public school teachers with 1 to 3 years of experience response rate) x (BTLS wave response rate). (Kaiser, 2011, p. B8)

Table 11 summarizes the unweighted and base-weighted unit response and overall response rates for the BTLS.

Unit Nonresponse Bias Analysis. The NCES analyzes the unit nonresponse bias for any survey stage with a base-weighted response rate of less than 85%. Even though the BTLS achieved or almost achieved an 85% base-weighted response rate in all stages, the NCES evaluated all waves of BTLS data files for potential bias. In order to evaluate the extent to which the adjustments reduced or eliminated nonresponse bias, comparisons between the eligible

respondents (respondents plus non-respondents) and the respondents were made before and after the NCES applied the noninterview weighting adjustments. For a complete description of how the NCES estimated the relative bias for respondents and nonrespondents, refer to (Kaiser, 2011).

Item Response Rates. Item response rates are the percentage of participants who answered a given survey question or item. Weighted item response rates are the number of sampled cases responding to an item divided by the number of sampled cases eligible to answer the item after adjusting by either the base or final weight. Each sampled unit's base weight is computed by multiplying the initial basic weight by the sampling adjustment factor. The final weight for each sampled unit is the base weight adjusted for unit nonresponse and then ratio adjusted to the frame total. Table 12 shows the base weighted and final weighted item response rates for BTLS public school teachers in the first, second, and third waves. The nonresponse bias analysis revealed no substantial evidence of item bias in the data files at the item level. For further information on the nonresponse bias analysis and item response rates for BTLS, see (Kaiser, 2011).

Weighting

Data weighting is done to scale up sample estimates to values that represent the target survey population. Since all interviewed beginning teachers in SASS were eligible for BTLS, weights for the BTLS first wave came directly from the 2007–08 SASS. TFNLWGT is the final weight variable for the first wave in SASS. It is called W1TFNLWGT in the BTLS data set. An initial basic weight (the inverse of the sampled teacher's probability of selection) is used as the starting point for the second and third waves of BTLS, and a weighting adjustment that reflects the impact of the SASS teacher weighting procedure is applied. Using data that are known about

the respondents and nonrespondents from the sampling frame, a nonresponse adjustment factor is calculated and applied next. Lastly, a ratio adjustment factor (which adjusts the sample totals to frame totals in order to reduce sampling variability) is calculated and applied. The final cross-sectional weights for the second and third waves of BTLS are the product of the factors listed above, and they appear in the data file as W2AFWT (applies to second wave respondents) and W2RAFWT (applies to respondents and retrospective respondents) for the second wave, and W3AFWT for the third wave. W3LWGT is provided for longitudinal analysis over the 3-year collection period. Longitudinal weights should be used whenever more than one wave of data is used to examine change over time within a single population. For further information on weighting, see Tourkin et al. (forthcoming).

Variance Estimation

Direct estimates of sampling errors that assume a simple random sample will typically underestimate the variability in the estimates in surveys with complex sampling designs like SASS and BTLS. "The SASS sample design and estimation include procedures that deviate from the assumption of simple random sampling, such as stratifying the school sample, oversampling new teachers, and sampling with differential probabilities" (Kaiser, 2011, p. B14). Therefore, users must employ more advanced calculations to estimate the variance accurately in the SASS and BTLS samples.

One such method of calculating sampling errors is replication. There are several ways to create replicate weights, but they are all based on a similar underlying logic. The sample is divided up into numerous subsamples (replicates), and the estimate of interest is calculated from both the full sample and from each replicate. The mean square error of the replicate estimates around the full sample estimate provides an estimate of the variance of the statistic.

> The BTLS data file includes one set of 88 replicate weights for each cross-sectional and longitudinal weight designed to produce variance estimates. The replicate weights for cross-sectional analysis are W1TREPWT1–W1TREPWT88 for the first wave, W2ARWT1–W2ARWT88 and W2RARWT1–W2RARWT88 (includes retrospective respondents) for the second wave, and W3ARWT1–W3ARWT88 for the third wave. For longitudinal analysis over the 3-year collection period, the replicate weights are W3LRWGT1–W3LRWGT88. (Kaiser, 2011, p. B15)

Reliability of Data

The BTLS First Through Third Wave Preliminary Data File is considered a preliminary data file for two reasons. First, due to the ongoing data collection, data are retroactively added whenever subsequent waves can provide previously missing, imputed, or inaccurately recorded data. Thus, data collected in the next wave may lead to changes in any of the previously collected waves. Second, NCES computed first wave weights before learning that seven members of the sample did not meet the definition of a beginning teacher. New information obtained during third wave processing revealed that five of them did not start teaching in 2007 or 2008, and two were not teachers of regularly scheduled classes. Therefore, these cases (representing 0.27% of the first wave weighted population) were removed. NCES is waiting until the release of the next preliminary data set in 2012 to reweight the subsequent waves. The 2012 release will also include data from the fourth wave, and the final dataset due out in 2013 will include the fifth wave. The final dataset will replace all other preliminary datasets and will be accompanied by expanded documentation. For more information about the data collection and processing, please see Tourkin et al. (forthcoming).

BTLS estimates are based on samples, and samples always have the possibility of differing substantially from the population being examined. Differences in the sample may occur whenever there are errors. Sample errors occur whenever the sample does not accurately represent the population. Nonsampling errors are caused by human errors such as, data entry errors, biased questions or processing, inappropriate analysis conclusions and false information provided by respondents. It is possible to estimate sampling errors, but not nonsampling errors. NCES utilized quality control and edit procedures in order to minimize errors made by respondents, coders, and interviewers.

Description of Variables

Appendix A lists all of the variables used in this report. Except for those variables created by the researcher, each variable originated in the Beginning Teacher Longitudinal Study (BTLS) Questionnaire, the 2007−08 Schools and Staffing Survey (SASS) Teacher Questionnaire, or the 2008−09 Teacher Follow-up Survey (TFS) Current and Former Questionnaires for First-Year Teachers. Additionally, this report includes "created variables" computed using survey variables, sampling frame variables, other NCES created variables, or a combination of these. In order to facilitate easier analysis of some of the more commonly used variables, NCES provides some created variables in their datasets. Unless otherwise noted, all variables in Appendix A can be found in the BTLS First Through Third Wave Preliminary Data File. The definitions for all BTLS variables used in this report are also included in Appendix A.

Research Questions

In order to test the hypotheses that induction programs and specific components of induction programs will be associated with higher retention rates of newly hired teachers, the following research questions were investigated. There are four main questions, three of which containing sub questions. Research Question 1 investigates the components of effective new

teacher induction programs, while Research Question 2 analyzes the impact of various induction program components on new teacher attrition rates. Research Question 3 analyzes the impact of various mentoring components of induction on new teacher attrition rates, while Research Question 4 uses a statistical model to predict the likelihood of retaining new teachers in the profession based on selected induction components.

Research Question 1: What are Essential Components of Effective New Teacher Induction Programs?

Research Question 1 required a review of the literature to identify studies citing effective induction programs and/or effective aspects of such programs. The search began on the internet with online databases such as JSTOR and ERIC with phrases like, "new teacher induction" and "new teacher mentoring." After limiting the search to sources published after 1980, there were nearly 2000 results. After further limiting of the search results to peer-reviewed sources and using quick scans of titles and abstracts, there were approximately 100 sources for initial review. During the review process, sources that were identified in multiple sources (either within the text or within the references) were added to the list or given precedence in the review process. Approximately 250 sources were reviewed.

Research Question 1a: What are the Teacher Induction Components Cited in the Literature as being Effective? During the review of the literature, any mention of components of effective programs or lists of recommended traits were recorded and tallied. While several studies looked at specific programs to determine what they were doing correctly, other sources offered opinions of what they felt were effective components. Initially, components were collected with no pre-determined themes in an effort to minimize biased interpretations. The researcher continued to record components in their original text until it came time to collate and

tabulate the results. At that point, themes were created for descriptions that were similar enough in wording to be grouped. For instance, "A structure for modeling effective teaching during in-services and mentoring" as suggested by Wong (2001, p. 2) was coded into the opportunities to "observe" theme. Likewise, Morgan and Kritsonis' suggestion that "the principal must set aside time regularly (weekly is ideal) to debrief and interact with new teachers" (2008, p. 5) was coded into the "supportive administration" theme.

Research Question 1b: How do Induction Program Retention Rates Compare? During the review of the literature, the researcher kept track of any programs listed as examples of effective induction programs as well as their frequency of mention. Even sources intended to study a specific program often listed examples of other well-known effective induction programs as examples or comparisons. Ultimately, the review of the literature resulted in roughly 50 distinct programs cited as being effective programs with nearly two-dozen listed by more than one author in more than one source. Of the programs cited as effective, retention rate data was gathered from 22 distinct programs.

Research Question 1c: Do Induction Programs Identified as Being Effective Include the Induction Program Components Most Often Cited in the Literature? This search began with the compilation of the approximately 50 programs found during the research for question two. Some citations such as "a successful program in Illinois" or a "South Texas Induction program" were too vague to investigate further. Programs that were cited by name (27) and those that could be inferred by their descriptions (4) comprised the final list of effective programs to investigate. Whenever possible, descriptions of the programs came directly from the source (either via their website or via email correspondence with directors and administrators). If direct descriptions were not available, this study utilized secondary sources such as the descriptions

offered in the source citing it as being effective. In these instances, the researcher always endeavored to find corroboration with a separate source from another author. A simple check to see if the list of components collated from the effective programs in research question three matched up with the consensus given by the literature and collected in research question one.

Research Question 2. Does Participation in a Teacher Induction Program and Associated Program Components (e.g., Seminars and Common Planning Time) Correlate with Higher Teacher Retention Rates for a National Sample of Teachers?

Based upon survey responses, NCES created variables W2STTUS and W3STTUS to classify teacher's employment status in years two and three. W2STTUS classifies teachers into the three categories of Leaver, Stayer, and Mover, while W3STTUS also includes the fourth category of Returner. Since work with teacher status is so prevalent, NCES also created the variables W2FCSTS and W3FCSTS to collapse each of the multi-category employment status variables into the two categories of "former" and "current," and included them in the BTLS data set to make analyses easier. W2STTUS and W3STTUS were the criterion variables for the various chi-square tests of association for this research question, while W2FCSTS and W3FCSTS were the criterion variables for the logistical regression analysis in Research Question 4. Any analysis of the wave-two status variables (W2FCSTS and W2STTUS) involved weighting with the W2RAFWT variable, while the wave-three variables (W3FCSTS and W3STTUS) used W3AFWT as a weight. NCES calculated all weights and included them with the datasets.

Research Question 2a: Does Participation in a New Teacher Induction Program Correlate with Higher Retention Rates? The predictor variable for this question was W1T0220 (In your FIRST year of teaching, did you participate in a teacher induction program?).

Respondents answered this question as part of the 2007-08 Schools and Staffing Survey (item 38), and only those responses from teachers who began their teaching careers in 2007 were included in the BTLS dataset. Both status variables (W2STTUS and W3STTUS) were used as the criterion variables when determining whether participation in a new teacher induction program correlates with new teacher attrition rates.

Research Question 2b: Do Induction Programs that Provide New Teachers with Reduced Teaching Schedules or Fewer Preparations Correlate with Higher Retention Rates? The predictor variable for this question was W1T0221 (In your FIRST year of teaching, did you receive a reduced teaching schedule or number of preparations?). Respondents answered this question as part of the 2007-08 Schools and Staffing Survey (item 39a), and only those responses from teachers who began their teaching careers in 2007 were included in the BTLS dataset. Both status variables (W2STTUS and W3STTUS) were used as the criterion variables when determining whether receiving a reduced teaching schedule or number of preparations correlates with new teacher attrition rates.

Research Question 2c: Do Induction Programs that Provide New Teachers with Common Planning Time with Teachers in Their Same Subject Correlate with Higher Retention Rates? The predictor variable for this question was W1T0222 (In your FIRST year of teaching, did you receive common planning time with teachers in your subject?). Respondents answered this question as part of the 2007-08 Schools and Staffing Survey (item 39b), and only those responses from teachers who began their teaching careers in 2007 were included in the BTLS dataset. Both status variables (W2STTUS and W3STTUS) were used as the criterion variables when determining whether receiving common planning time with teachers in your subject correlates with new teacher attrition rates.

Research Question 2d: Do Induction Programs that Provide New Teachers with Ongoing Seminars and Professional Development Correlate with Higher Retention Rates? The predictor variable for this question was W1T0223 (In your FIRST year of teaching, did you receive seminars or classes for beginning teachers?). Respondents answered this question as part of the 2007-08 Schools and Staffing Survey (item 39c), and only those responses from teachers who began their teaching careers in 2007 were included in the BTLS dataset. Both status variables (W2STTUS and W3STTUS) were used as the criterion variables when determining whether receiving seminars or classes for beginning teachers correlates with new teacher attrition rates.

Research Question 2e: Do Induction Programs that Provide New Teachers with Extra Classroom Assistance such as a Teacher Aide Correlate with Higher Retention Rates? The predictor variable for this question was W1T0224 (In your FIRST year of teaching, did you receive extra classroom assistance such as a teacher aide?). Respondents answered this question as part of the 2007-08 Schools and Staffing Survey (item 39d), and only those responses from teachers who began their teaching careers in 2007 were included in the BTLS dataset. Both status variables (W2STTUS and W3STTUS) were used as the criterion variables when determining whether receiving extra classroom assistance such as a teacher aide correlates with new teacher attrition rates.

Research Question 2f: Do Induction Programs that Provide New Teachers with Regular Supportive Communication with Their Administrators Correlate with Higher Retention Rates? The predictor variable for this question was W1T0225 (In your FIRST year of teaching, did you receive regular supportive communication with your principal, other administrators, or department chair?). Respondents answered this question as part of the 2007-08

Schools and Staffing Survey (item 39e), and only those responses from teachers who began their teaching careers in 2007 were included in the BTLS dataset. Both status variables (W2STTUS and W3STTUS) were used as the criterion variables when determining whether receiving regular supportive communication with your principal, other administrators, or department chair correlates with new teacher attrition rates.

Research Question 2g: Do Induction Programs that Provide New Teachers with Ongoing Guidance or Feedback from a Mentor or Master Teacher Correlate with Higher Retention Rates? The predictor variable for this question was W1T0226 (In your FIRST year of teaching, did you receive ongoing guidance or feedback from a master or mentor teacher?). Respondents answered this question as part of the 2007-08 Schools and Staffing Survey (item 39f), and only those responses from teachers who began their teaching careers in 2007 were included in the BTLS dataset. Both status variables (W2STTUS and W3STTUS) were used as the criterion variables when determining whether receiving ongoing guidance or feedback from a master or mentor teacher correlates with new teacher attrition rates.

Research Question 2h: Do Induction Programs that Provide New Teachers with Various Combinations of the Previously Tested Components Correlate with Higher Retention Rates? The predictor variables for this question were the researcher created variables INDUCT and INDUCT2 that were created from the variables W1T0221-W1T0226 to measure various combinations of induction traits. INDUCT and INDUCT2 are ordinal with six and two categories respectively. Both status variables (W2STTUS and W3STTUS) were used as the criterion variables when determining whether participation in a new teacher induction program comprised of various combinations of components correlates with new teacher attrition rates.

Research Question 3: Does Participation in a New Teacher Induction Program with Mentoring and Associated Mentoring Components (e.g., Mentor in Same Subject and/or Grade, Conducting Observations) Correlate with Higher Teacher Retention Rates for a National Sample of Teachers?

The Teacher Follow-Up Survey 2008-2009 obtained information on the type of mentoring new teachers had in their first year of teaching. The questions were separate from those concerning induction (Research Question 2), so it was possible that respondents had mentoring and mentoring components without having an induction program. W2STTUS and W3STTUS were the criterion variables for the various chi-square tests of association for this research question, while W2FCSTS and W3FCSTS were the criterion variables for the logistical regression analysis in Research Question 4. Any analysis of the wave-two status variables (W2FCSTS and W2STTUS) involved weighting with the W2RAFWT variable, while the wave-three variables (W3FCSTS and W3STTUS) used W3AFWT as a weight. NCES calculated all weights and included them with the datasets.

Research Question 3a: Does Having a Mentor During the First Year of Induction Correlate with Higher Retention Rates? The predictor variables for this question were W2MNTYN and MENTIND. W2MNTYN (question 18a from TFS-2L and 8a from TFS-3L), asked if respondents had a mentor assigned to them in their first year of teaching (2007-08). MENTIND was created to assess the combination of mentoring and induction. MENTIND created a grouping of respondents based upon how they responded to W1T0220 and W2MNTYN. This enabled the examination of those who stated they had an induction program (W1T0220 = 1) and a mentor (W2MNTYN = 1) versus those who had induction, but did not have a mentor (W1T0220 = 1, W2MNTYN = 2), versus those who had a mentor, but did not

have induction (W1T0220 = 2, W2MNTYN = 1), versus those who did not have either a mentor or induction (W1T0220 = 2, W2MNTYN = 2). Both status variables (W2STTUS and W3STTUS) were used as the criterion variables when determining whether having a mentor assigned to teachers in their first year of teaching (2007-08) correlates with new teacher attrition rates.

Research Question 3b: Does Having a Mentor with Experience Teaching Either the Same Subject or the Same Grade Level Correlate with Higher Retention Rates? The predictor variables for this question were W2MNSUB, W2MNGRA, and MNGRASUB. W2MNSUB (question18c on TFS-2L and 8c on TFS-3L), asked respondents if the master or mentor teacher ever taught students in the same subject area as theirs, while W2MNGRA (18d on TFS-2L and 8d on TFS-3L) asked if the master or mentor teacher ever taught students at the same grade level as theirs. MNGRASUB combined the two categories and allowed for the testing of each combination of same subject and/or grade level. Both status variables (W2STTUS and W3STTUS) were used as the criterion variables when determining whether having a mentor in the same grade level and/or subject area as the mentee correlates with new teacher attrition rates.

Research Question 3c: Does the Frequency with which New Teachers Meet with Their Mentors During the First Year of Induction Correlate with Higher Retention Rates? The predictor variable for this question was W2MNFRQ (18e and 8e), which asked how frequently new teachers worked with their mentor during their first year of teaching. The choices were ‘at least once a week,’ ‘once or twice a month,’ ‘a few times a year,’ and ‘never.’ Both status variables (W2STTUS and W3STTUS) were used as the criterion variables when

determining whether the frequency with which new teachers meet with their mentors during their first year of induction correlates with new teacher attrition rates.

Research Question 3d: Does the Frequency with which Mentors Observe New Teachers Present Lessons During the First Year of Induction Correlate with Higher Retention Rates? The predictor variable for this question was W2MNOBS (18f and 8f), which asked respondents to report on how frequently their mentor observed them in their classroom during the 2007-08 school year. The choices were 'at least once a week,' 'once or twice a month,' 'a few times a year,' and 'never.' Both status variables (W2STTUS and W3STTUS) were used as the criterion variables when determining whether the frequency with which mentors observe new teachers present lessons during their first year of induction correlates with new teacher attrition rates.

Research Question 3e: Does the Extent to which New Teachers Feel a Mentor Improved Their Overall Teaching During the First Year of Induction Correlate with Higher Retention Rates? The predictor variables for this question were W2MNIMP and MENTIMP. W2MNIMP asked respondents to rate the extent to which their assigned master teacher or mentor improved their overall teaching skills during their first year of teaching. Respondents were asked to choose between 'not at all,' 'to a small extent,' 'to a moderate extent,' and 'to a great extent.' MENTIMP was created to collapse the four response categories of W2MNIMP into two categories, low and high. Both status variables (W2STTUS and W3STTUS) were used as the criterion variables when determining whether the extent to which new teachers feel a mentor improved their overall teaching during their first year of induction correlates with new teacher attrition rates.

Research Question 4: Can a Statistical Model be Developed to Predict the Likelihood of Retaining a Teacher After Their First and Second Year of Teaching Based on Selected Induction Program Components?

Data were analyzed by predicting the nominal variables of teacher status W2FCSTS and W3FCSTS using Logistic Regression. Participation in an induction program W1T0220 and having a mentor W2MNTYN during their first year of teaching were entered first into the model because of their overarching properties. Next, a forward selection model was used to enter the induction component and mentoring trait variables. It is hypothesized that induction programs that include components based on variables that are predictive would be more effective at reducing new teacher attrition. Subsequent models allowed for the entrance of any variable using the FORWARD selection process in SAS to see which component variables contributed most and in what order. Odds ratios and probabilities were calculated to aid in the interpretation of the findings.

Summary

After analysis is complete, a generic picture of an effective program should emerge. Predictive probabilities of the logistic regression analysis will help to determine which aspects of induction and mentoring are most important in the design of an effective induction program. Generalized induction programs utilizing different combinations of the predictors are presented with the hope that their implementation could help to lower teacher attrition rates. Analysis of the preceding research questions will facilitate the recommendation of general themes needed to make a generic induction program effective at reducing attrition rates. Ideally, any school in any district could use the recommendations to design a simple and cost-effective induction program that could help lower their new teacher attrition rates.

Chapter 4

Results

There are four main research questions of interest in this study divided into various sub questions. Research Question 1 is divided into three parts in order to determine what are the essential components of effective new teacher induction programs, while Research Question 2 examines the correlation between induction programs components and new teacher attrition rates with eight separate sub questions. Research Question 3 examines the impact of mentoring components on new teacher attrition rates with five sub questions, while Research Question 4 creates a statistical model to predict the likelihood of retaining a new teacher for two to three years based the use of selected induction components.

Research Question 1: What are Essential Components of Effective New Teacher Induction Programs?

Research Question 1 required a review of the literature to identify studies citing effective induction programs and/or effective aspects of such programs. The search began on the internet with online databases such as JSTOR and ERIC with phrases like, "new teacher induction" and "new teacher mentoring." After limiting the search to sources published after 1980, there were nearly 2000 results. After further limiting of the search results to peer-reviewed sources and using quick scans of titles and abstracts, there were approximately 100 sources for initial review. During the review process, sources that were identified in multiple sources (either within the text or within the references) were added to the list or given precedence in the review process. Approximately 250 sources were reviewed.

Research Question 1a: What are the Teacher Induction Components Cited in the Literature as Being Effective? After a thorough review of the literature, a list of the most

commonly mentioned components in effective induction programs was compiled. Only 52 of the more than 100 sources reviewed explicitly listed components of effective induction programs. Themes emerged from the literature about what components matter most, and the three most common components were mentors, collaboration with other teachers, and sustained professional development. Strong support from the principal or administration was on half of the lists, while having opportunities to observe good teaching practices and be observed teaching were both on slightly less than half of the lists. Providing release time or a reduced teaching load for new teachers showed up on approximately a third of the lists, while only 25% of the sources cited networking with an outside agency. Table 10 presents a list of the nine most commonly listed components with their frequencies and percentages.

Having an experienced mentor in the same subject area and/or grade level was cited most frequently. Of the 52 sources that listed or recommended effective components, all 52 (100%) listed having a mentor as being essential. Although not every source made the stipulation that the mentor needed to be in the same grade and/or subject matter or experienced, almost two-thirds (33) did mention one or more of these factors. Adding in those sources that instead mentioned that a lack of training made mentors ineffective (6), 75% of the sources make the stipulation that providing a mentor that is experienced and in the same subject area and/or grade level is really necessary for an induction program to be successful at reducing new teacher induction rates.

Most experts in the field of teacher retention agree that new teachers need to collaborate with other teachers on issues such as classroom discipline, curriculum design, and lesson planning, and 60% of the teacher induction programs studied included this component. It is also widely accepted that ongoing, structured professional development (58%) will help a novice in any career. Since senior personnel typically determine policies, it is no surprise that a supportive

principal/administrator (50%) is considered necessary. Many studies that survey new teachers about their recommendations for induction list a desire for more chances to observe good teaching practices (44%) and/or to be observed teaching themselves (42%).

There was a relatively low frequency with which researchers recommended giving new teachers any form of release time (31%) or a reduced teaching load (29%). It would seem that lessening the teaching responsibilities of a new teacher either through time off or fewer course preparations would be necessary in order to provide them with the time needed to attend professional development seminars or to meet regularly with their mentor and other collaborating teachers. It might be assumed that when an author suggests providing such things as "regularly scheduled meetings with their mentor" or "professional development seminars throughout the first year," that they are assuming the administration will give the new teachers the necessary time off, and thus they do not feel the need to explicitly list it in their recommendations.

Research Question 1b: How do Induction Program Retention Rates Compare? The literature lists several induction programs thought to be effective. Some of the claims are corroborated by separate sources and some have empirical data to support their claims of success. Unfortunately, there were many induction programs cited as being effective that did not report any form of descriptive or statistical analyses showing a reduction in attrition rates. Retention rates for 22 programs were available and were analyzed for this component of the study. Table 4 lists the retention rates that were publicly available (or able to be obtained through personal contact).

Comparing attrition rates created several challenges. The biggest problem was the reliability of the sources. Almost every source failed to cite the origin of their data, so it was impossible to verify their results. Additionally, it was unknown if data presented were from the

primary source, or if they were secondary data sources. With the assumption that most studies might be biased towards trying to provide evidence of the necessity or importance of induction, the comparative results should be interpreted with caution. Even when interpreted with caution, many of the 22 programs with reported new teacher retention rates had evidence to support their claim that their induction programs were related to decreasing attrition rates.

The 22 programs listed in Table 4 had first year retention rates that ranged from 86.9% to 99.0% with a median of 91.1%. This study chose to report medians rather than means, because of the lack of the ability to weight the rates properly. However, the medians where almost identical to the means in every category. The median values for one, two and five year rates (91.1, 84.0, 65.1 respectively) were noticeably higher than the national averages of 85%, 72.3%, and 44.4% (respectively), and the normalized one year rate was 95.6% in comparison to the national rate of 84.7%. For the 16 programs that listed a comparison rate, the median percent decrease in attrition rate seen after the implementation of the program was 70.5%. Based upon the Department of Education's estimated 7 billion dollar annual cost of hiring and training new teachers, a nationwide program with this success rate could potentially save taxpayers almost 5 billion dollars per year.

Research Question 1c: Do Induction Programs Identified as Being Effective Include the Induction Program Components Most Often Cited in the Literature. A content analysis of program components was compiled from the 22 induction programs listed in Table 4. The majority of the programs listed most, and in some cases all, of the components listed in Table 10 and examined in research question 1a. In fact, all 22 programs listed having a mentor, offering some form of ongoing professional development, support from the administration, and collaborating with other teachers. More than 75% (17) of the programs explicitly listed the use of

observations, while only half (11) mentioned some form of release time. Again, this may be because some form of release time is assumed in order to provide the new teachers with enough time to attend seminars and meetings. The only real deviation from the list was the frequency with which programs cited networking with outside organizations. While the literature only cited this 25% of the time, 64% of the successful programs (14) made mention of this overtly, and some of those not specifically mentioning networking with outside organizations alluded to this type of activity. A possible explanation for this discrepancy is that most of these programs worked closely with local universities or other organizations, so networking is necessitated almost purely by design. Table 13 provides a comparison of the percentage of successful programs including each characteristic. The results indicate that the successful programs may be more comprehensive than the general literature's recommendations with substantially higher proportions of successful programs including almost all nine of the components listed.

Research Question 2: Does Participation in a Teacher Induction Program and Associated Program Components (e.g., Seminars and Common Planning Time) Correlate with Higher Teacher Retention Rates for a National Sample of Teachers?

Before answering the quantitative research questions, it is first necessary to provide descriptive statistics of the dataset and several variables. After NCES removed any misreported participants from the sample, the size of the BTLS dataset fell to $N = 1992$ with a weighted total of $N = 150{,}000$, which represents the approximate number of new teachers hired in the United States for the 2007-08 school year. All of the NCES variables are nominal with only two categories (1 = yes and 2 = no), while the two author created variables INDUCT and INDUCT2 are ordinal with six and two categories respectively. Table 14 lists the weighted and unweighted frequencies of the status variables, while Tables 15 and 16 list all of the variables used in

Research Question 2 and 3 respectively with their respective weighted and unweighted frequencies and relative frequencies along with missing value amounts. Appendix A contains detailed descriptions of all variables used in this study.

Tables 17 and 18 list the two-way weighted frequencies of variables used in Research Question 2, while Table 19 displays the chi square analysis results for Research Question 2. Chi square analyses determined which relationships were statistically significant. Due to the large sample size, all but one of the relationships examined resulted in a statistically significant association at the alpha = .0001 level. Therefore, effect sizes were calculated using Cramer's *V*. According to sources, (e.g., http://www. acastat.com/ statbook/chisqassoc.htm; http://sociology.camden.rutgers.edu/curriculum /format.htm) any value less than .10 is a weak association. Associations with corresponding Cramer's *V* values between .10 and .25 are moderate, while anything above .25 is a strong association. (Note: While every source referenced agreed that .10 was the lower bound for a moderate association, the upper bound ranged between .15 and .30.) The two-way frequency tables 17 and 18 help further illustrate the effective differences in teacher employment status in year two (W2STTUS) and year three (W3STTUS) respectively based on whether or not respondents had each of the indicated induction components.

Research Question 2a: Does Participation in a New Teacher Induction Program Correlate with Higher Teacher Retention Rates? The weighted frequencies of teachers who are classified as a current teacher, former teacher, or a current teacher who has changed to a new school or district in year two (W2STTUS), and year three (W3STTUS) were categorized by whether or not they had participated in an induction program in their first year of teaching (W1T0220) and displayed in Tables 17 and 18 respectively.

Initial chi square analysis (Table 19) revealed a significant association (χ^2 = 1225.34; p = .0001; V = .0905) between participating in an induction program during the first year of teaching (W1T0220) and teacher employment status in 2008-09 (W2STTUS), with 8.8% of beginning public school teachers who reported having an induction program not teaching in 2008-09 compared to 15.4% of new teachers who did not participate in an induction program not teaching in 2008-09. Although this result was slightly below the .10 lower bound for a moderate Cramer's V result, the corresponding large differences in attrition rates support the interpretation that there is a meaningful association between participating in an induction program and second year teacher status.

A significant association (χ^2 = 2852.58; p = .0001; V = .1379) also existed between participating in an induction program and teacher employment status in 2009-10 (W3STTUS), with 10.7% of teachers who participated in an induction program not teaching in 2009-10 compared to 20.1% of teachers who did not participate in an induction program not teaching in 2009-10. In both years, teachers who did not participate in an induction program during their first year of teaching left the profession at nearly twice the rate of those who received induction.

Research Question 2b: Do Induction Programs that Provide New Teachers with Reduced Teaching Schedules or Fewer Preparations Correlate with Higher Retention Rates? There was a significant association (χ^2 = 7.02; p = .0299; V = .0068) between having a reduced teaching schedule (W1T0221) and teacher employment status in year two (2008-09). However, this was not a meaningful association since 9.83% of those having a reduced teaching load were not teaching in 2008-09 compared to 9.99% of those without a reduced teaching load not teaching in 2008-09. As stated previously, large sample sizes may cause statistically significant results even when effect sizes indicate an association is not meaningful. The effect

size for this association (V = .0068) and the difference in the two-way frequencies are both too small to consider the association between having a reduced teaching schedule and teacher employment status in year two meaningful.

Similarly, there was a significant association (χ^2 = 444.83; p = .0001; V = .0538) between having a reduced teaching schedule (W1T0221) and teacher employment status in year three (2009-10). However, this association is also small. Of those teachers who received a reduced teaching schedule or fewer class preparations, 14.34% were no longer teaching in year three, compared to only 11.95% of those teachers who did not receive a reduced teaching schedule. Not only is this difference smaller than what might be considered meaningful, but it is also in the direction opposite to what the literature would indicate is expected. The direction of the difference in the percentages was in the wrong direction for both Leavers and Returners, with less than one percent of the respondents having a reduced schedule returning to teaching in year three compared to 3% of the respondents who did not have a reduced schedule returning to teaching in year three. Recall that the percentage of teachers who left after the first year was almost identical for both groups, so not only did having a reduced teaching schedule not aid in keeping teachers in the profession past the first year, but it also failed to help bring more of them back to the profession later.

Research Question 2c: Do Induction Programs that Provide New Teachers with Common Planning Time with Teachers in Their Same Subject Correlate with Higher Retention Rates? There was a significant association (χ^2 = 148.98; p = .0001; V = .0312) between having common planning times (W1T0222) and teacher employment status in year two (2008-09). However, this was not a meaningful association since 9.34% of those having common planning times with other teachers in their subject were not teaching in year two compared to

11.04% of those without common planning times with other teachers in their subject area not teaching in year two.

Similarly, there was a significant association ($\chi^2 = 2072.6$; $p = .0001$; $V = .1162$) between having common planning times (W1T0222) and teacher employment status in year two (2008-09). However, unlike the association with teacher employment status in year two, having common planning time did have a meaningful association with teacher employment status in year three. Of those teachers having common planning times with other teachers in their same subject, 77.7%% were still teaching at the same school in year three, compared to only 69.2%% of those teachers who did not have common planning times with other teachers in their same subject were still teaching in the same school in year three. Although the percentages of Leavers were similar for both those having common planning time (11.5%) and those who did not have common planning time (13.7%), there was a meaningful difference in the percent who stayed (cited above) and those who moved (7.87% and 14.59% respectively). It is possible that having common planning times with other teachers in the same subject allowed for a larger proportion of teachers in that group to form meaningful bonds with other teachers in their departments, which could lend to fewer teachers wanting to move to other schools.

Research Question 2d: Do Induction Programs that Provide New Teachers with Ongoing Seminars and Professional Development Correlate with Higher Retention Rates?

There was a significant association ($\chi^2 = 1702.21$; $p = .0001$; $V = .1054$) between having ongoing seminars and professional development during the first year of teaching (W1T0223) and teacher employment status in year two (2008-09). The association is also meaningful because only 8.6% of teachers having ongoing seminars left teaching in year two compared to 15.5% of teachers who did not have ongoing seminars leaving the profession in year two. In year two, teachers who

did not have ongoing seminars or professional development during their first year of teaching left the profession at approximately twice the rate of those teachers who did have ongoing seminars and professional development during their first year of teaching.

Similarly, there was a significant association ($\chi^2 = 3907.36$; $p = .0001$; $V = .1595$) between having ongoing seminars and teacher employment status in year three. This association was also meaningful with only 10.1% of the teachers having seminars leaving teaching in year three compared to 20.1% of teachers who did not have seminars leaving teaching in year three. The percent change was similar in year three with teachers having ongoing seminars or professional development during their first year of teaching leaving the profession at approximately half the rate of those teachers who did not have ongoing seminars and professional development during their first year of teaching.

Research Question 2e: Do Induction Programs that Provide New Teachers with Extra Classroom Assistance such as a Teacher Aide Correlate with Higher Retention Rates? There was a significant association ($\chi^2 = 513.78$; $p = .0001$; $V = .0579$) between having extra classroom assistance (W1T0224) and teacher employment status in year two (2008-09). However, this was not a meaningful association since 8.6% of those having extra classroom assistance were not teaching in year two compared to 10.6% of teachers without extra classroom assistance not teaching in year two. The percentage of teachers having extra help (72.5%) and continued to teach in the same school in year two was also relatively close to the percentage of teachers who did not have extra help (74.8%) and continued to teach at the same school in year two.

Similarly, there was a significant association ($\chi^2 = 801.4$; $p = .0001$; $V = .0722$) between having extra classroom assistance and teacher employment status in year three (2009-10).

However, this association is also not meaningfully large. Of those teachers having extra classroom assistance during their first year of teaching, 11.8% were no longer teaching and 72.1% were still teaching in the same school in year three, compared to 12.6% of the teachers who did not receive extra classroom assistance were no longer teaching and 75.8% were still teaching in the same school in year three. A higher percentage of teachers who did not have extra classroom assistance during their first year of teaching were still teaching at the same school in year three compared to teachers who did have extra classroom assistance during their first year of teaching.

Research Question 2f: Do Induction Programs that Provide New Teachers with Regular Supportive Communication with Their Administrators Correlate with Higher Retention Rates? There was a significant association ($\chi^2 = 2167.81$; $p = .0001$; $V = .1190$) between having regular supportive communication with a principal, department chair, or other administrator during the first year of teaching (W1T0225) and teacher employment status in year two (2008-09). The association is also meaningful because only 8.9% of teachers having regular supportive communication left teaching in year two compared to 17.6% of teachers who did not have regular supportive communication leaving the profession in year two. In year two, teachers who did not have regular supportive communication with their administrators during their first year of teaching left the profession at approximately twice the rate of those teachers who did have regular supportive communication with their administrators during their first year of teaching.

Similarly, there was a significant association ($\chi^2 = 2202.62$; $p = .0001$; $V = .1198$) between having regular supportive communication and teacher employment status in year three. This association was also meaningful with only 11.1% of the teachers having regular supportive

communication with their administrators leaving teaching in year three compared to 20.6% of teachers who did not have regular supportive communication with their administrators leaving teaching in year three. The percent change was similar in year three with teachers having regular supportive communication with their administrators during their first year of teaching leaving the profession at approximately half the rate of those teachers who did not have regular supportive communication with their administrators during their first year of teaching.

Research Question 2g: Do Induction Programs that Provide New Teachers with Ongoing Guidance or Feedback from a Mentor or Master Teacher Correlate with Higher Retention Rates? There was a significant association ($\chi^2 = 156.43$; $p = .0001$; $V = .0320$) between having ongoing guidance or feedback from a mentor or master teacher during the first year of teaching (W1T0226) and teacher employment status in year two (2008-09). However, this was not a meaningful association since 9.59% of the teachers having ongoing guidance and feedback during their first year were not teaching in year two compared to 12.03% of teachers who did not have ongoing guidance and feedback during their first year were not teaching in year two. The percentage of teachers having ongoing guidance and feedback during their first year (74.2%) who continued to teach in the same school in year two was also relatively close to the percentage of teachers who did not have ongoing guidance and feedback during their first year (73.3%) and continued to teach at the same school in year two.

Similarly, there was a significant association ($\chi^2 = 682.67$; $p = .0001$; $V = .0667$) between having ongoing guidance or feedback and teacher employment status in year three (2009-10). However, this association is also not meaningful. Of those teachers having ongoing guidance or feedback during their first year of teaching, 11.8% were no longer teaching and 74.4% were still teaching in the same school in year three, compared to 15.3% of the teachers who did not receive

ongoing guidance or feedback were no longer teaching and 75.6% were still teaching in the same school in year three. A slightly higher percentage of teachers who did not have ongoing guidance or feedback during their first year of teaching were still teaching at the same school in year three compared to teachers who did have ongoing guidance or feedback during their first year of teaching. However, teachers who did have ongoing guidance or feedback in their first year of teaching returned to teaching in year three (3.1%) at more than three times the rate of the teachers who did not have ongoing guidance or feedback from a mentor or master teacher (0.9%) during their first year of teaching.

Research Question 2h: Do Induction Programs that Provide New Teachers with Various Combinations of the Previously Tested Components Correlate with Higher Retention Rates? After analyzing the strengths of association of each individual induction component to teacher status, the researcher created two variables (INDUCT and INDUCT2) to test the strength of association of teacher employment status to various combinations of induction components. Since the literature review suggested that a reduced teaching schedule, common planning time, seminars, supportive administrators, and feedback from mentors were all important induction components, INDUCT included various combinations of these components. The created variable INDUCT had a significant and meaningful association with teacher employment status in year two ($\chi^2 = 2317.28$; $p = .0001$; $V = .1301$) and year three ($\chi^2 = 5082.08$; $p = .0001$; $V = .1593$). Further analysis of the corresponding frequencies suggests that having an induction program with seminars for beginning teachers and regular supportive communication from administrators has the strongest association with teacher employment status in years two and three. When analyzing INDUCT, only 5.81% of teachers having both seminars and regular supportive communication with their administrators and nothing else from the list of tested

components during their first year induction program left teaching in year two compared to 5.82% of teachers who also had ongoing mentor feedback, 5.93% of teachers having all six induction components, and 30.5% of teachers who reported having induction with none of the induction components listed. Similarly, only 5.24% of teachers having both seminars and regular supportive communication with their administrators during their first year of teaching left the profession in year three compared to 39.3% of teachers having induction without any of the listed components leaving the profession in year three. Unfortunately, the number of respondents in each of these categories is too small (N = 37, 270, 83, and 50 unweighted respectively) to generalize the results to the entire population of new teachers in the United Stated, but they do suggest that providing seminars and supportive communication with administrators lowers attrition. However, the addition of induction components after seminars and supportive administrators does not improve retention rates.

Since seminars and supportive administrators resulted in the largest levels of association, INDUCT2 was created to compare those teachers who experienced at least both of these components versus those teachers having neither. The created variable INDUCT2 had a significant and meaningful association with teacher employment status in year two (χ^2 = 2824.99; p = .0001; V = .1345) and in year three (χ^2 = 4592.73; p = .0001; V = .1712). Only 7.6% of teachers having at least seminars and supportive communication with their administrators left teaching in year two compared to 15.7% of teachers who did not have at least both components left teaching in year two. In year three, 9.5% of teachers having both components were not teaching, while 19.7% of teachers who did not have at least both components were not teaching. Because the unweighted number of teachers having at least seminars and supportive communication (N = 1263) and the number of teachers that did not have at least both

components (N = 729) are both large enough to generalize, the results support the theory that induction programs that at least incorporate seminars for beginning teachers and regular supportive communication with their administrators could affect retention rates in a positive manner.

Research Question 3: Does Participation in a New Teacher Induction Programs with Mentoring and Associated Mentoring Components (e.g., Mentor in Same Subject and/or Grade, Conducting Observations) Correlate with Higher Teacher Retention Rates for a National Sample of Teachers?

Similar to Research Question 2, the dataset used for Research Question 3 is the BTLS dataset (N = 1992) with a weighted total that represents approximately 150,000 new teachers in the United States. Three variables (W2MNTYN, W2MNGRA, and W2MNSUB) are nominal with only two categories (1 = yes and 2 = no), while the remaining six variables are ordinal or with two or more categories. Table 14 lists the weighted and unweighted frequencies of the status variables, while Tables 15 and 16 list all of the variables used in Research Question 2 and 3 respectively with their respective weighted and unweighted frequencies and relative frequencies along with missing value amounts. Appendix A contains detailed descriptions of all variables used in this study.

Tables 20 and 21 list the two-way weighted frequencies of variables used in Research Question 3, while Table 22 displays the chi square analysis results for Research Question 3. Chi square analyses determined which relationships were statistically significant. Due to the large sample size, all of the relationships examined resulted in a statistically significant association at the alpha = .0001 level. Therefore, effect sizes were calculated using Cramer's V. The two-way frequency tables 20 and 21 help further illustrate the effective differences in teacher employment

status in year two (W2STTUS) and year three (W3STTUS) respectively based on whether or not respondents had each of the indicated induction or mentoring components.

Research Question 3a: Does Having a Mentor during the First Year of Induction Correlate with Higher Retention Rates? Frequency tables on the status variables of whether a respondent is a current teacher, former teacher, or a current teacher who has changed to a new school or district (W2STTUS, and W3STTUS) were categorized by whether or not they had a mentor (W2MNTYN) during their first year of teaching (2007-08) and weighted by the appropriate weights (W2RAFWT, and W3AFWT).

Initial chi square analysis (Table 22) revealed a significant association ($\chi^2 = 1747.25$; $p = .0001$; $V = .1058$) between having a mentor during the first year of an induction program and teacher employment status in 2008-09, with 8.4%% of beginning public school teachers who reported having a mentor during their first year of teaching not teaching in 2008-09 compared to 16.3% of new teachers who did not have a mentor during their first year of teaching not teaching in 2008-09.

A significant association ($\chi^2 = 4036.08$; $p = .0001$; $V = .1611$) also existed between having a mentor during their first year of teaching and teacher employment status in 2009-10, with 9.8% of teachers having a mentor during their first year of teaching not teaching in year three compared to 22.5% of teachers who did not have a mentor during their first year of teaching not teaching in year three. In both years, teachers who did not have a mentor during their first year of teaching left the profession at approximately twice the rate of those who did have a mentor during the first year of their induction program.

The TFS question (W2MNTYN), "Last school year (2007-08), were you assigned a master or mentor teacher by your school or school district?" was separate from questions

regarding whether the teachers participated in an induction program or not. In order to determine if having a mentor as part of an induction program, it was necessary to create the variable MENTIND in order to classify respondents by how they responded to both W2MNTYN (did they have a mentor in 2007-08) and W1T0220 (did they participate in an induction program in 2007-08). MENTIND contains four categories: Respondents who had both a mentor and an induction program (W2MNTYN = YES, W1T0220 = YES), respondents who participated in an induction program but did not have a mentor (W1T0220 = YES, W2MNTYN = NO), respondents who had a mentor but did not participate in an induction program (W2MNTYN = YES, W1T0220 – NO), and respondents who had neither an induction program nor a mentor (W1T0220 = NO, W2MNTYN = NO).

The created variable MENTIND had a significant and meaningful association with teacher employment status in year two ($\chi^2 = 2593.09$; $p = .0001$; $V = .0931$) and year three ($\chi^2 = 5780.83$; $p = .0001$; $V = .1137$). Although the Cramer's V value for the year two association was slightly below the .10 lower bound for a moderate association, the corresponding two-way frequencies (Tables 20 and 21) justify the meaningful interpretation. Further analysis of the corresponding frequencies suggests that an induction program with a mentoring component is associated with the lowest attrition rates of the four categories. When analyzing MENTIND, only 7.61% of teachers having both an induction program and a mentor during their first year of teaching left teaching in year two compared to 15.87% of teachers who had induction without a mentoring component, 13.23% of teachers who had a mentor without an induction program, and 18.95% of teachers who reported having neither an induction program nor a mentor during their first year of teaching. Similarly, only 8.96% of teachers having both an induction program and a mentor during their first year of teaching left teaching in year three compared to 20.35% of

teachers who had induction without a mentoring component, 15.41% of teachers who had a mentor without an induction program, and 25.72% of teachers who reported having neither an induction program nor a mentor during their first year of teaching.

Research Question 3b: Does Having a Mentor with Experience Teaching Either the Same Subject or the Same Grade Level Correlate with Higher Retention Rates? There was a significant association ($\chi^2 = 370.53$; $p = .0001$; $V = .0586$) between having a mentor with experience teaching at the same grade level (W2MNGRA) and teacher employment status in year two (2008-09). However, this was not a meaningful association since 7.6% of the teachers having a mentor with experience teaching at the same grade level were not teaching in year two compared to 6.8% of the teachers who did not have a mentor with experience teaching at the same grade level not teaching in 2008-09. Not only is this difference too small to be meaningful, but it is also in the wrong direction. Teachers having mentors with experience teaching at the same grade level left the profession at higher rates than teachers having mentors that did not have experience teaching at the same grade level.

Similarly, there was a significant association ($\chi^2 = 403.21$; $p = .0001$; $V = .0610$) between having a mentor with experience teaching at the same grade level and teacher employment status in year three. However, this association is also not meaningfully large. Of those teachers having a mentor with experience teaching at the same grade level, 8.4% were no longer teaching in year three, compared to only 8.9% of teachers having a mentor without experience teaching at the same grade level leaving teaching in year three.

Having a mentor with experience teaching the same subject had slightly better results. There was a significant association ($\chi^2 = 376.98$; $p = .0001$; $V = .0588$) between having a mentor with experience teaching the same subject (W2MNSUB) and teacher employment status in year

two (2008-09). However, this was not a meaningful association since 7.3% of the teachers having a mentor with experience teaching the same subject were not teaching in year two compared to 8.3% of the teachers who did not have a mentor with experience teaching the same subject not teaching in year two. Although similar to the results for W2MNGRA, at least having a mentor with experience teaching the same subject correlated to attrition rates LOWER than the rates correlated to mentors who did not have experience teaching the same subject.

Like before, there was a significant association ($\chi^2 = 3048.04$; $p = .0001$; $V = .1669$) between having a mentor with experience teaching the same subject and teacher employment status in year three. However, this time the association was meaningful. Of those teachers having a mentor with experience teaching the same subject, only 6.98% were no longer teaching in year three, compared to 13.85% of teachers having a mentor without experience teaching the same subject leaving teaching in year three.

In order to test the conjunctive case, the variable MNGRASUB was created. There was a significant association ($\chi^2 = 974.51$; $p = .0001$; $V = .0672$) between having a mentor with experience teaching the same subject and grade level and teacher employment status in year two. However, this was not a meaningful association since 7.93% of the teachers having mentors with experience teaching both the same subject and grade level were not teaching in year two compared to 10.49% of the teachers having mentors without experience teaching both the same subject and grade level were not teaching in year two.

Similarly, there was a significant association ($\chi^2 = 1733.43$; $p = .0001$; $V = .0895$) between having a mentor with experience teaching the same subject and grade level and teacher employment status in year two, but it was not meaningful. Of the teachers who had mentors with experience in both grade level and subject area, 7.9% left teaching in year two compared to

10.5% of the teachers who had mentors with no experience in either the same grade level or subject area. However, unlike the association with teacher employment status in year two, having mentors with experience teaching both the same subject and grade level did have a significant (χ^2 = 4244.29; p = .0001; V = .1143) and meaningful association with teacher employment status in year three. Of the teachers having mentors with experience teaching both the same subject and grade level, 7.8% were not teaching in year three compared to 18.7% of the teachers having mentors without experience teaching either the same subject and grade level were not teaching in year three. Teachers having mentors in the first year of induction who do not have experience teaching either the same subject or grade level left the teaching profession in year three at more than twice the rate of the teachers having mentors with experience teaching both the same subject and grade level.

Research Question 3c: Does the Frequency with which New Teachers Meet with Their Mentors during the First Year of Induction Correlate with Higher Retention Rates? There was a significant association (χ^2 = 2030.05; p = .0001; V = .0965) between how frequently new teachers meet with their mentors during the first year of induction (W2MNFRQ) and teacher employment status in year two. However, this was a weak association since 6.48% of the teachers who met with their mentors at least once per week during the first year of induction were not teaching in year two compared to 9.97% of the teachers who met with their mentors once or twice per month during the first year of induction were not teaching in year two.

Similarly, there was a significant association (χ^2 = 3071.01; p = .0001; V = .0967) between how frequently new teachers meet with their mentors during the first year of induction and teacher employment status in year three. This was a slightly more meaningful association with only 6.46% of the teachers who met with their mentors at least once per week during the

first year of induction not teaching in year three compared to 12.13% of the teachers who met with their mentors once or twice per month during the first year of induction not teaching in year three.

Research Question 3d: Does the Frequency with which Mentors Observe New Teachers Present Lessons during the First Year of Induction Correlate with Higher Retention Rates? There was a significant association ($\chi^2 = 682.68$; $p = .0001$; $V = .0561$) between how frequently mentors observed new teachers presenting lessons during the first year of induction (W2MNOBS) and teacher employment status in year two. However, this was a confounded association since 8.29% of the teachers whose mentors observed them presenting lessons at least once per week and 5.89% of the teachers whose mentors observed them presenting lessons once or twice per month during the first year of induction were not teaching in year two compared to 7.83% of the teachers who reported their mentors never observed them presenting lessons during the first year of induction not teaching in year two.

Similarly, there was a significant association ($\chi^2 = 1266.11$; $p = .0001$; $V = .0622$) between how frequently mentors observed new teachers presenting lessons during the first year of induction and teacher employment status in year three. This was a confounded association as well with only 6.81% of the teachers whose mentors observed them presenting lessons at least once per week and 12.13% of the teachers whose mentors observed them presenting lessons once or twice per month during the first year of induction not teaching in year three compared to 8.31% of the teachers who reported their mentors never observed them presenting lessons during the first year of induction not teaching in year three.

Research Question 3e: Does the Extent to which New Teachers Feel a Mentor Improved their Overall Teaching during the First Year of Induction Correlate with Higher Retention Rates? There was a significant association ($\chi^2 = 4166.1$; $p = .0001$; $V = .1384$) between the perceived amount that the mentor improved the new teacher's overall teaching skills during the first year of induction (W2MNIMP) and teacher employment status in year two. This was a meaningful association because the percent of teachers leaving the profession in year two decreased with each increase in the level of perceived teaching improvement caused by the master or mentor teacher. Of the teachers who felt their mentor had improved their overall teaching skills to a "great extent" and to a "moderate extent," only 4.36% and 5.40% (respectively) left teaching in the second year, compared to 10.71% and 14.19% of the teachers who felt their mentor had improved their overall teaching skills to a "small extent" and "not at all" (respectively) left teaching in the second year.

Similarly, there was a significant association ($\chi^2 = 4758.86$; $p = .0001$; $V = .1206$) between the perceived amount that the mentor improved the new teacher's overall teaching skills during the first year of induction and teacher employment status in year three. This was a confounded association because the percent of teachers leaving the profession in year three did not decrease consistently with increases in perceived levels of overall teaching improvement caused by master or mentor teachers. Of the teachers who felt their mentor had improved their overall teaching skills to a "great extent" and to a "moderate extent," 7.27% and 5.87% (respectively) left teaching in the third year, compared to 12.60% and 10.87% of the teachers who felt their mentor had improved their overall teaching skills to a "small extent" and "not at all" (respectively) left teaching in the second year. The teachers who felt their master or mentor teacher had improved their teaching skills to a moderate extent left teaching at a lesser rate than

teachers who felt their master or mentor teacher had improved their overall teaching skills to a higher extent. Additionally, the highest rate of attrition was the group of teachers who felt their master or mentor teacher had improved their teaching to a "small" extent as opposed to the group that felt their master or mentor teacher had not improved their overall teaching skills at all during their first year of teaching.

Because there appeared to be a larger difference between the two higher improvement groups (great extent, moderate extent) and the two lower improvement groups (small extent, not at all) than there was within the two groups, the variable MENTIMP was created to analyze the higher and lower groups. There was a significant association ($\chi^2 = 1740.21$; $p = .0001$; $V = .1265$) between the perceived amount that the master or mentor teacher improved the new teacher's overall teaching skills during the first year of induction (MENTIMP) and teacher employment status in year two. This association was meaningful with only 4.95% of the teachers who felt their master or mentor teachers provided a high level of improvement to their overall teaching skills leaving teaching during the second year, compared to 11.82% of teachers who felt their master or mentor teachers provided a low level of improvement to their overall teaching skills leaving teaching during the second year.

Similarly, there was a significant association ($\chi^2 = 1570.2$; $p = .0001$; $V = .1200$) between the perceived amount that the master or mentor teacher improved the new teacher's overall teaching skills during the first year of induction and teacher employment status in year three. This association was meaningful with only 6.47% of the teachers who felt their master or mentor teachers provided a high level of improvement to their overall teaching skills leaving teaching in year three, compared to 12.07% of teachers who felt their master or mentor teachers provided a low level of improvement to their overall teaching skills leaving teaching in year three.

Research Question 4: Can a Statistical Model be Developed to Predict the Likelihood of Retaining a Teacher After Their First and Second Year of Teaching Based on Selected Induction Program Components?

This study examined a prediction model for new teacher retention that utilized variables from the 2009-10 Beginning Teacher Longitudinal Study (BTLS) on the presence of induction program specifics and mentoring traits. New teacher retention was selected as an important criterion because attrition causes a large financial burden on already budget-limited districts, and consistent turnover affects teacher effectiveness and student learning. Results of a logistic regression analysis indicated that the presence of an induction program, the presence of a mentor, and the presence of seminars or classes for beginning teachers along with regular or supportive communication from the principal or other administrators were significant predictors for teacher retention in a sample of 1992 new teachers. Generalized induction programs utilizing each of the significant predictors were presented with the expectation that their use would increase teacher retention, resulting in greater overall teacher effectiveness and student learning.

A logistic regression analysis was conducted using respondents' answers to survey questions about induction program specifics during their first year of teaching to measure new teacher attrition in years two and three. Initial analysis utilized 15 predictor variables to determine which components of induction programs correlated to new teacher retention in years two and three. The final analysis utilized eight predictor variables with forward selection to model teacher retention in years two and three. The number of participants in the final analysis was 1745 for year two retention rates and 1631 for year three.

Initial attempts to model all 15 variables were unsuccessful due to the highly correlated nature of some variables, and the linear combination of others. Due to the nesting of the

mentoring components survey questions, W2MNTYN (were you assigned a master or mentor teacher by your school or school district) was a linear combination of the mentoring component questions (W2MNGRA, W2MNSUB, W2MNFRQ, W2MNOBS, W2MNIMP), which prevented W2MNTYN from entering the model along with any of the other mentoring component variables. Entering all 15 variables in the model using forward regression, with inclusion requiring a significant relationship at alpha = .05, onlyW2MNOBS (how frequently did your master or mentor teacher observe you in your classroom) and W2MNIMP (overall, to what extent did your assigned master or mentor teacher improve your teaching) entered the model for both years two and three, while W2MNFRQ (how frequently did you work with your master or mentor teacher) entered the model for year three. Because the presence of a mentor is cited in the literature as being vital to the effectiveness of an induction program and only three mentoring component variables entered the model initially, it was decided that W2MNTYN should enter the model in place of any mentoring component variables.

The presence of a mentor (W2MNTYN), the presence of an induction program (W1T0220), and the presence of induction program components such as, a reduced teaching schedule (W1T0221), common planning time with teachers in the same subject (W1T0222), seminars or classes for beginning teachers (W1T0223), extra classroom assistants (e.g., teacher aides) (W1T0224), regular or supportive communication with a principal or other administrators (W1T0225), and ongoing guidance for feedback from a master or mentor teacher (W1T0226) were entered into the model using forward regression with appropriate weighting and inclusion requiring a significant relationship at an alpha = .05 level. All eight variables were retained in the model for both years two and three (see Table 23).

Year Two New Teacher Employment Status. The unadjusted R^2 for predicting year-two employment status using the eight variables (W2MNTYN and W1T0220-W1T0226) was 0.89 with a sample size of 1745 unweighted and 149391.7 weighted. Although the R^2 value is not a measure of the variance in the criterion variable predicted using the predictor variables, it does provide a comparison measure for other logistic regression models designed to predict teacher retention. The percent concordant was 60.9, the percent discordant was 35.4, and the percent tied was 3.7 with 287,224 pairs. The odds ratio for W1T0220 was 1.42, indicating that a new teacher who participated in an induction program during their first year of teaching was 1.42 times as likely to still be teaching in year two compared to a new teacher who did not participate in an induction program during their first year of teaching. The odds ratio for W2MNTYN was 2.09, indicating that a new teacher who was assigned a mentor teacher during their first year of teaching was 2.09 times as likely to still be teaching in year two compared to a new teacher who did not have a mentor during their first year of teaching. The odds ratio for W1T0225 was 2.24, indicating that a new teacher who received regular supportive communication from a principal or other administrators during their first year of teaching was 2.24 times as likely to still be teaching in year two compared to a new teacher who did not receive regular supportive communication from a principal or other administrators during their first year of teaching. The odds ratio for W1T0223 was 1.38, indicating that a new teacher who received seminars or classes for beginning teachers during their first year of teaching was 1.38 times as likely to still be teaching in year two compared to a new teacher who did not receive seminars or classes for beginning teachers during their first year of teaching. The odds ratio for W1T0224 was 1.27, indicating that a new teacher who received extra classroom assistance (e.g., teacher aide) during their first year of teaching was 1.27 times as likely to still be teaching in year two compared to a new teacher

who did not receive extra classroom assistance (e.g., teacher aide) during their first year of teaching. The remaining three variables each resulted in odds ratios less than one, which implies that new teachers receiving each of the three induction components (W1T0221 – reduced teaching schedule, W1T0222 – Common planning time, and W1T0226 – ongoing feedback from a master or mentor teacher) were less likely to still be teaching in year two compared to teachers who did not receive each of the induction components (see Table 23).

Since the presence of extra classroom assistance did not have a meaningful association to new teacher employment status in year two and most induction programs rarely incorporate only one component, odds ratios and probabilities were calculated for all combinations of the remaining four variables (W1T0220, W2MNTYN, W1T0225, and W1T0223) holding the other four variables (W1T0221, W1T0222, W1T0224, and W1T0226) to a response of not being present. According to the model, new teachers who responded "no" to all eight variable questions had a 68.94% probability of still teaching in year two. According to the U.S. Department of Education statistics, 15.28% of teachers leave each year, which extrapolates to 71.77% still teaching after two years, which is similar to the predicted value from the model.

The various combinations of induction, mentoring, and induction components resulted in probabilities ranging from 75.36% to 95.32% (see table 24). The mentoring component resulted in the largest single probability with 82.28% of new teachers likely to continue teaching in year two if they had a mentor during their first year of teaching. The combination of an induction program with a mentor resulted in an 86.84% probability of still teaching in year two, while adding regular supportive communication with a principal or administrator to this pair of components raised the probability to 93.66%. An induction program incorporating a mentor, supportive communication, and seminars for new teachers has a predicted probability of 95.32%

of new teachers still teaching in year two. Recall that these same four variables had consistently meaningful associations to employment status in the chi square analyses.

Year Three New Teacher Employment Status. The unadjusted R^2 for predicting year-three employment status using the eight variables (W2MNTYN and W1T0220-W1T0226) was 0.97 with a sample size of 1631 unweighted and 148690.2 weighted. The percent concordant was 60.3, the percent discordant was 36.0, and the percent tied was 3.7 with 313,984 pairs. The odds ratio for W1T0220 was 1.36, indicating that a new teacher who participated in an induction program during their first year of teaching was 1.36 times as likely to still be teaching in year three compared to a new teacher who did not participate in an induction program during their first year of teaching. The odds ratio for W2MNTYN was 2.42, indicating that a new teacher who was assigned a mentor teacher during their first year of teaching was 2.42 times as likely to still be teaching in year three compared to a new teacher who did not have a mentor during their first year of teaching. The odds ratio for W1T0225 was 2.04, indicating that a new teacher who received regular supportive communication from a principal or other administrators during their first year of teaching was 2.04 times as likely to still be teaching in year three compared to a new teacher who did not receive regular supportive communication from a principal or other administrators during their first year of teaching. The odds ratio for W1T0223 was 1.77, indicating that a new teacher who received seminars or classes for beginning teachers during their first year of teaching was 1.77 times as likely to still be teaching in year three compared to a new teacher who did not receive seminars or classes for beginning teachers during their first year of teaching. The odds ratio for W1T0224 was 1.06, indicating that a new teacher who received extra classroom assistance (e.g., teacher aide) during their first year of teaching was 1.06 times as likely to still be teaching in year three compared to a new teacher who did not receive extra

classroom assistance (e.g., teacher aide) during their first year of teaching. The remaining three variables each resulted in odds ratios less than one, which implies that new teachers receiving each of the three induction components (W1T0221 – reduced teaching schedule, W1T0222 – Common planning time, and W1T0226 – ongoing feedback from a master or mentor teacher) were less likely to still be teaching in year three compared to teachers who did not receive each of the induction components (see Table 25).

Since the presence of extra classroom assistance did not have a meaningful association to new teacher employment status in year three and most induction programs rarely incorporate only one component, odds ratios and probabilities were calculated for all combinations of the remaining four variables (W1T0220, W2MNTYN, W1T0225, and W1T0223) that, according to the model, improved the odds of remaining in teaching in year three. According to the model, new teachers who responded "no" to all four variable questions had a 62.29% probability of still teaching in year three. According to the U.S. Department of Education statistics, 15.28% of teachers leave each year, which extrapolates to 60.81% still teaching after three years, which is again similar to the predicted value from the model.

The various combinations of induction, mentoring, and induction components resulted in probabilities ranging from 69.26% to 95.16% (see table 26). Once again, the mentoring component resulted in the largest single probability with 80.00% of new teachers likely to continue teaching in year three if they had a mentor during their first year of teaching. The combination of an induction program with a mentor resulted in an 84.51% probability of still teaching in year three, while adding regular supportive communication with a principal or administrator to this pair of components raised the probability to 91.76%. An induction program incorporating a mentor, supportive communication, and seminars for new teachers has a

predicted probability of 95.16% of new teachers still teaching in year three. Recall that these same four variables had consistently meaningful associations to employment status in the chi square analyses.

Summary

Results from the two-way frequencies and chi square analyses are consistent with the results obtained from the logistic regression model. Whether modeling all 15 variables or just the induction variables plus the presence of a mentor or not, regular supportive communication with a principal or other administrator (W1T0225) and the presence of an induction program (W1T0220) always resulted in increases to the probability of teaching in both years. Similarly, both variables had consistently meaningful associations to employment status in both years. Providing seminars or classes for new teachers (W1T0223) had meaningful associations to employment status while also increasing the predicted probability of teaching in the logistic regression model for both years. While (W2MNIMP) the perceived amount of improvement to overall teaching skills attributed to the influence of a mentor teacher during the first year of teaching was left out of the logistic regression model to allow for the testing of the presence of a mentor, it had consistently meaningful associations to employment status and increases to the predicted probability of still teaching in both years. The frequency with which mentors observed new teachers (W2MNOBS) entered the model in both years but did not increase the probability of still teaching in either year, while the frequency with which new teachers met with their mentor during the first year of teaching (W2MNFREQ) only entered the model for year three, with each increasing level of frequency resulting in a new teacher being 1.44 times as likely to still teach in year three. However, allowing W2MNTYN (the presence of a mentor) into the

models instead of the mentoring component variables resulted in much larger odds ratios for years two and three teacher employment status (2.09 and 2.42 respectively).

The results of the logistic regression analysis suggest that new teachers who participate in an induction program during their first year of teaching that includes a mentor, regular supportive communication with their principal or administrators, and seminars or classes for new teachers are 9.17 times more likely to still be teaching in year two and 11.91 times more likely to still be teaching in year three compared to new teachers who did not have any form of induction. If educational policy makers wish to create a new teacher induction program with the highest probability of retaining teachers into their second and third years of teaching, they should create programs that include mentors, seminars and classes for new teachers, and regular supportive communication with the teachers' principals, department chairs, or other administrators.

Chapter 5

Discussion

This study utilized one-way frequencies, chi square tests of association, and logistic regression to provide information that could identify factors that affect new teacher retention. This study used the Beginning Teacher Longitudinal Study (BTLS) 2012 preliminary dataset, which is a nationally representative sample collected by the United States Department of Education in conjunction with the National Center for Education Statistics (NCES) through a series of surveys. The surveys involved were the 2007-08 Schools and Staffing Survey (SASS), the 2008-09 Teacher Follow-up Survey (TFS), and the 2009-2010 BTLS survey.

Research shows that 50% of teachers leave the profession within their first five years of teaching. Research also indicates that participating in an effective new teacher induction program with an experienced mentor correlates with higher retention rates. The ability to identify which aspects of an induction program and which characteristics of mentors influence new teachers' decision to remain in teaching would help with the creation of induction programs that are more effective at lowering attrition rates. Therefore, factors related to the presence of an induction program and its specific components were analyzed along with factors related to the presence of a mentor and specific mentor traits in order to determine which factors correlated most with lower teacher attrition.

Summary

A thorough review of the literature revealed nine important components for an effective induction program with an experienced mentor being the most important of the nine. Every source agreed that an experienced mentor was essential, and most added the stipulation that the mentor needed to teach in the same subject area as their mentees even though the analysis of the

NCES data did not support this additional component as being effective at lowering attrition rates. Nearly two-thirds of the sources listed sustained professional development and collaborating with others as essential, while half stated a need for a supportive principal or administrator. Nearly half of the sources thought observations were key, while only a third stated the importance of giving new teachers release time or a reduced teaching schedule in order to facilitate time to spend at seminars and with their mentors. It is likely that more sources felt this was essential but did not list it explicitly because they felt it was an assumed necessity when providing seminars and other things that require time outside of the classroom. Only 25% of the sources cited networking with outside organizations in their lists of effective components, while nearly two-thirds of the effective programs examined included some form of networking with an outside organization. This discrepancy is most likely because a large proportion of successful programs are communal in nature with outside organizations already officially linked to the programs from the inception.

A thorough review of the literature also revealed a list of very popular induction programs. Regardless of their reported retention rates, most experts consider a few induction programs to be among the best. The California Beginning Teacher Support and Assessment (BTSA) is one of the biggest programs and most successful at retaining teachers. Although retention rates vary from district to district, they still maintain a statewide average retention rate of 93%. The Lafourche parish FIRST program in Louisiana is another of the best programs in existence, according to the literature. Their average retention rates have stayed above 90% for the last two decades. The Flowing Wells program in Arizona is so successful that they provide yearly training seminars where they teach other school administrators how to implement the

program into their own schools. These are just a few of the more widely known programs that the literature cites as effective.

All of the successful programs investigated in this report had experienced mentors, sustained professional development, support from the administration, and collaboration with other teachers. Over three-fourths of the programs also included opportunities for new teachers to observe good teaching practices as well as opportunities to be observed teaching themselves. Additionally, half of the programs explicitly listed release time or reduced teaching loads for new teachers and/or the mentors. It is surprising that release time was not cited more often, but it could be far more common than it would seem on the surface. It may be possible that some form of release time is assumed necessary in order to facilitate various aspects of the induction programs, and therefore, it is not explicitly listed by more sources. Networking with outside organizations was far more prevalent in the effective programs than it was in the lists of suggested components. This could be because most effective induction programs began in partnerships with outside agencies. Therefore, a strong relationship with an outside agency was part of the program design from day one.

The types of induction programs are almost as varied as the teachers that go through them each year. The effective ones tend to have similar components and themes that agree with the majority of what the literature suggests. "The best professional development programs allow teachers to observe others, to be observed by others, and to be part of groups in which teachers share together, grow together, and learn to respect one another's work" (Wong, 2003, p. 47). Other than the slight differences in relative frequencies, the literature seems to agree with the list of effective induction program components gathered in this study. The relative frequencies of the components are higher in the effective programs than they are in the lists of suggested

components, which is understandable. If the list of components in the literature contribute to effectiveness, it would be logical that effective programs would have a higher percentage of the components in their induction programs.

The investigation of the frequencies of BTLS participants who were still teaching in subsequent years showed significant differences among some groups. Participants who indicated they did not have an induction program in their first year of teaching left the profession at roughly twice the rate of those having an induction program during their first year. Additionally, those who stated they did not have seminars (W1T0223) or regular supportive communication with their administrators (W1T0225) left teaching in both years at roughly twice the rate as those having either program characteristic. Further analysis utilizing chi square tests of association revealed a strong association between the presence of an induction program with seminars and supportive communication and teacher status in the second and third years of teaching.

Investigation of the influence of mentors revealed similar results to those obtained from the induction variables. A 2006 report by MetLife found that "having a mentor during the first year of teaching significantly increases the odds that a teacher will stay in the profession" (p. 77), which agrees with the results of this study. In this study, the respondents who indicated not having a mentor left teaching in both years at more than twice the rate of those having a mentor. Assuming an experienced mentor would help teachers improve their teaching skills more than a mentor without proper training, W2MNIMP implies that training helped as well. Respondents who stated their mentor helped increase their teaching skills at high levels left in both years at half the rate of those who indicated low levels of improvement. Additionally, those having both induction and mentoring left at nearly a third the rate of those who reported having neither. Further chi square tests of association verified the hypothesized associations between mentoring

and retention. Effect sizes revealed the strongest relationships between teacher status and level of teaching improvement (W2MNIMP), frequency with which they met (W2MNFRQ), teaching the same subject (W2MNSUB), and having a mentor or not (W2MNTYN).

The results of the logistic regression analysis suggest that new teachers who participate in an induction program during their first year of teaching (W1T0220) that includes a mentor (W2MNTYN), regular supportive communication with their principal or administrators (W1T0225), and seminars or classes for new teachers (W1T0223) are 9.17 times more likely to still be teaching in year two and 11.91 times more likely to still be teaching in year three compared to new teachers who did not have any form of induction. Teachers who receive this type of induction program have a 95.32% predicted probability of remaining in teaching in year two and a 95.16% predicted probability of remaining in teaching in year three. Without any of these four support mechanisms, the likelihood of a new teacher remaining in the profession after year two or year three is 69% and 62%, respectively. Thus the implementation of the four induction-related support components can result in 53% increase in the probability that a teacher will remain in the profession for three years. If educational policy makers wish to create a new teacher induction program with the highest probability of retaining teachers into their second and third years of teaching, they should create programs that include mentors, seminars and classes for new teachers, and regular supportive communication with the teachers' principals, department chairs, or other administrators.

"The weight of accumulated evidence clearly shows that traditional sink-or-swim induction contributes to high attrition and to lower levels of teacher effectiveness" (NCTAF, 1996, p. 40). According to the Baccalaureate and Beyond Longitudinal Study, teachers who did not participate in an induction program in their schools or districts were nearly twice as likely to

leave the classroom (26%) as those who participated in such a program (15%). The fourth annual 50 state report by education week, *Quality Counts 2000*, reported similar findings for teachers in their first three years of teaching. It would appear that effective induction contributes to lower attrition rates, and in order for an induction program to have the best chance of being effective, it should include an experienced mentor that teaches the same subject area as their mentees. Effective induction programs also need sustained, personalized professional development throughout the first three years of teaching so new teachers can continue to grow and hone their craft. New teachers must have opportunities to observe good teaching practices, and they themselves need to receive constructive feedback after being observed teaching. Providing opportunities to collaborate with other novice or veteran teachers is essential, and having collaborators from their same subject area and grade level whenever possible is also beneficial. Finally yet importantly, an effective induction program must have the support of the other teachers, the principal and administrators, the school district, and even the parents. "The successful induction of beginning teachers, it is now widely recognized, is a vital link in what should be a career-long continuum of professional development, [and] the first couple of years on the job seem to set the tone" (Glassford & Salinitri, 2007, p. 2). A 2002 report from Education Week ranked states with the most improved teacher quality, and nine of the top 10 states on the list require and finance some form of new teacher induction.

Implications for Practice

The purpose of this study was to supplement the lack of literature on evaluations of induction program effectiveness as it pertains to reducing attrition rates. With the impending exodus of Baby-Boomer teacher retirees, education leaders and administrators need to focus on the retention of new teachers. Research shows that roughly 50% of new teachers leave the

profession within their first five years of teaching, and effective induction programs can help cut attrition rates in half. Based on the literature review and the results of this study, any school that wishes to lower their attrition rates should implement an effective induction program.

This study confirmed the results of the literature on teacher induction and its potential impact on teacher attrition rates – teachers who participate in effective induction programs tend to remain in the teaching profession at a higher rate than those who do not (Henke, et al., 2000; Ingersoll & Kralik, 2004; Ingersoll & Smith, 2003; Metropolitan Life, 1991, 2005, 2006, 2008; NCTAF, 1996, 2003, 2007; Odell & Ferraro, 1992; Smith & Ingersoll, 2004). Educational leaders must utilize research-based induction programs to improve retention of new teachers, while collecting many quality data to help determine what does and does not work.

Limitations

The results of this study are limited to elementary and secondary public school teachers. The results of this study should not be generalized to private, BIE, charter or non-traditional schools. The largest limitation in this study is the lack of control over survey questions. More detailed follow-up questions on induction and mentoring specifics could help to answer many unanswered research questions. Additionally, more questions addressing specifically why teachers left the profession would help to determine how to keep them from leaving. The sample size is large enough to allow for generalizability to the larger population of United States public schools, but the sample size drops drastically if you try to look at more specific groups of teachers like elementary math or secondary science etc.

Although this study presents evidence of strong correlations between types of induction and retention rates, it is unable to show that induction causes increases in retention. According to Rockoff (2008, p. 2), “nearly all published and unpublished evaluations of mentoring programs

have used research methodologies that fall short of providing credible estimates of the causal impacts of mentoring," and this study is unfortunately no different.

Recommendations for Further Research

The research conducted for this study contributes to the body of research on new teacher retention through quality induction. Although numerous previous studies have examined the various induction programs offered throughout the United States, few have tried to determine what components the effective programs have in common or how those components might influence retention rates. It is the hope of this researcher that this study will initiate ideas for future research to improve the induction of new teachers.

According to Ingersoll & Kralik, "there is need for assessment of the existing empirical research on teacher induction and mentoring in order to determine its scope and merit, and the conclusions that may be drawn from it" (2004, p. 4). "Rather than identifying the prevalence of induction support, future research should endeavor to assess program quality and guide educators in the provision of valuable induction for new teachers" (Winstead Fry, 2007, p. 216). "Since the presence of induction may not be enough to reduce attrition rates, research needs to move beyond determining the prevalence of induction and begin to assess form and quality" (Winstead Fry, 2007, p. 218). "To inform mentoring policy and practice, we need more direct studies of mentoring and its effects on teaching and teacher retention" (Feiman-Nemser, 1996, p. 3). In addition to the suggestions supported by other researchers, this study also suggests:

- Further research should be conducted and thoroughly analyzed on sustained support using induction programs that continue the professional development of new teachers beyond the first year of teaching.

- Further research is recommended on what makes a good mentor and how to pair new teachers with compatible mentors.
- Conduct a mixed methods study using a small sample of teachers from different school systems to get a better understanding of the relationship between school size, subjects taught, socioecomonic status (SES), teacher demographics, induction program components, and new teachers' intentions to remain in the profession. A mixed methods design is truly needed to determine "why" a factor influenced a teacher's decision to leave or stay.
- Conduct a study to identify which induction program components contribute the most towards new teachers' level of satisfaction with their jobs.
- More in depth analysis of the NCES data set to determine if induction programs and associated components have varying effects on teachers in different subject areas and grade levels.
- More in depth analysis of the NCES data set to determine if licensure paths, school sizes and locations, and other demographic details influence the effectiveness of induction programs.
- A final recommendation is to conduct a study to identify which induction program components contribute the most towards new teachers' level of teaching effectiveness by tracking student improvement as well as self-reported feelings of increased skills and peer evaluations.

Any of these recommendations could help create a clearer picture of why teachers leave the profession, why teachers decide to stay, and what education leaders can do to keep more of the best and brightest in classrooms.

Conclusion

After a thorough review of the literature and the results of this study, it is clear that there are induction programs that contribute to the lowering of new teacher attrition rates. It is also clear that teachers who do not receive support in the first years are more likely to leave the profession. "Turnover in the first few years is particularly high because new teachers are typically given the most challenging teaching assignments and left to sink or swim with little or no support" (NCTAF, 1996, p. 39). Although a "one-size-fits-all" mentality towards induction programs would not work, there are certain aspects that every program could and should share. "The best professional development programs allow teachers to observe others, to be observed by others, and to be part of groups in which teachers share together, grow together, and learn to respect one another's work" (Wong, 2003, p. 47).

Finding and utilizing the right mentor is paramount to the success of almost any induction program. "Mentoring is an integral component of an effective and sustained induction program, a one-on-one process where an experienced teacher helps guide, advise and support a new teacher" (Shakrani, 2008, p. 3). "Mentoring is an important strategy for retaining new teachers and for career-long, teacher-to-teacher professional development as a method of capturing the wisdom that comes with experience" (Metropolitan Life, 2008, p. 144). However, just assigning anyone to be a mentor is not enough.

Successful mentors need extra training in order to be effective. Mentors should receive high quality training before they begin, and they should remain in contact with other mentors in order to share experiences and offer useful tips and strategies (Holloway, 2001). Most experts agree that mentors should have experience teaching the same subject area and grade level as their mentees. Teaching in the same grade and/or subject area allows for more in depth discussions, of

effective instructional strategies, important standards to cover, and classroom management issues (Wayne, Youngs, & Fleischman, 2005). Additionally, "mentors should be allowed time to observe the novice" (Renard, 2003, p. 63). "It is also beneficial to arrange for the novice teacher to observe his or her mentor as well as other teachers throughout the school" (Arnold-Rogers et al., 2008, p. 19). However, none of this can happen if new teachers are not given appropriate scheduling to allow for extra time spent on induction program related activities. New teachers "need sympathetic timetabling and—ideally—a lower overall amount of teaching; again, this kind of general principle has long been established in the school sector" (Cunningham, 2007, p. 89).

Policies begin at the top, so there must be a strong sense of support for both the new teachers and the induction process itself from the principal and administrators. If those at the top do not buy in to the principle of the induction process initiated in their schools or districts, then the program is destined to fail. "Induction must be a structured training process coupled with an ongoing process of support from the school site administrators, staff developers, mentors, and teachers" (Wong, 2001, p. 2).

Some of the more popular programs illustrate several features of effective induction programs: the creation of cohort groups allows novice teachers to collaborate with other beginners to solve problems and develop a sense of community with others in similar circumstances; opportunities for beginning teachers to observe and be observed by skilled veterans develops good teaching skills while fostering a sense of collegiality and continual learning; opportunities for mentors to discuss their practice with novices allows them to make their thought processes explicit; pairing new teachers with mentors of the same grade level or subject enables new teachers to pursue specific questions about content; and regular supportive

communication with their administrators fosters a sense of belonging and a career-long yearning for continued professional development. It is clear that paying careful attention to how we nurture novice teachers through induction programs during their first few years of on-the-job training will lead to higher retention rates, more effective teaching skills learned earlier, and far better learning outcomes for the students in their classrooms, clear through to the end of their careers.

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Tables

Table 1

Number and Percentage Distribution of Teacher Stayers, Movers, and Leavers, by Sector: Selected Years 1988–89 through 2008–09

	Number				Percent		
Sector & Year	Total	Stayers	Movers	Leavers	Stayers	Movers	Leavers
Public							
1988-89	2,386,500	2,065,800	188,400	132,300	86.6%	7.9%	5.5%
1991-92	2,553,500	2,237,300	185,700	130,500	87.6%	7.3%	5.1%
1994-95	2,555,800	2,205,300	182,900	167,600	86.3%	7.2%	6.6%
2000-01	2,994,700	2,542,200	231,000	221,400	84.9%	7.7%	7.4%
2004-05	3,214,900	2,684,200	261,100	269,600	83.5%	8.1%	8.4%
2008-09	3,380,300	2,854,900	255,700	269,800	84.5%	7.6%	8.0%
Totals	17,085,700	14,589,700	1,304,800	1,191,200	85.4%	7.6%	7.0%
Private							
1988-89	311,900	242,500	29,700	39,700	77.7%	9.5%	12.7%
1991-92	353,800	287,100	23,200	43,500	81.1%	6.6%	12.3%
1994-95	376,900	310,100	21,700	45,000	82.3%	5.8%	11.9%
2000-01	448,600	354,800	37,600	56,200	79.1%	8.4%	12.5%
2004-05	465,300	374,600	27,600	63,100	80.5%	5.9%	13.6%
2008-09	487,300	386,000	24,000	77,300	79.2%	4.9%	15.9%
Totals	2,443,800	1,955,100	163,800	324,800	80.0%	6.7%	13.3%
Grand Total	19,529,500	16,544,800	1,468,600	1,516,000	84.7%	7.5%	7.8%

SOURCE: U.S. Department of Education, National Center for Education Statistics, Teacher Follow-up Survey (TFS), Current and Former Teacher Data Files, 2008–09; Teacher Attrition and Mobility: Results from the 2004–05 Teacher Follow-up Survey, U.S. Department of Education, National Center for Education Statistics (NCES 2007-307).

Table 2

Number and Percentage Distribution of Public School Teacher Stayers, Movers, and Leavers, by Selected Teacher and School Characteristics in Academic Year 2008-09

Teacher or school characteristic	Number				Percent		
	Total	Stayers	Movers	Leavers	Stayers	Movers	Leavers
Total	3,380,300	2,854,900	255,700	269,800	84.5%	7.6%	8.0%
School Type							
Traditional Public	3,309,200	2,800,700	247,600	260,900	84.6%	7.5%	7.9%
Public Charter	71,100	54,200	8,100	8,900	76.2%	11.4%	12.5%
Base Salary							
Less than $30,000	183,900	157,700	13,140	13,100	85.8%	7.1%	7.1%
$30,000 - $39,999	761,500	626,100	75,940	59,400	82.2%	10.0%	7.8%
$40,000 - $49,999	1,119,300	936,900	87,750	94,600	83.7%	7.8%	8.5%
$50,000 or more	1,315,700	1,134,200	78,830	102,600	86.2%	6.0%	7.8%
Gender							
Male	762,000	642,900	59,210	59,900	84.4%	7.8%	7.9%
Female	2,618,300	2,212,000	196,460	209,900	84.5%	7.5%	8.0%
Race/Ethnicity							
Caucasian, non-Hispanic	2,807,300	2,385,400	195,890	226,000	85.0%	7.0%	8.1%
African-American, non-Hisp	257,800	207,600	26,900	23,300	80.5%	10.4%	9.0%
Hispanic, regardless of race	232,200	194,500	24,800	12,900	83.8%	10.7%	5.6%
Asian/Pac Islander, non-Hisp	45,400	36,400	5,400	3,700	80.2%	11.9%	8.1%
Two or more races, non-Hisp	25,900	21,400	1,870	2,700	82.6%	7.2%	10.4%
Main assignment field							
Early childhood/gen elem	1,102,000	958,900	81,130	61,900	87.0%	7.4%	5.6%
Special education	396,500	309,100	38,790	48,600	78.0%	9.8%	12.3%
Arts/music	212,800	188,100	15,890	8,800	88.4%	7.5%	4.1%
English/language arts	418,800	342,700	32,210	43,900	81.8%	7.7%	10.5%
Mathematics	276,200	236,400	18,470	21,300	85.6%	6.7%	7.7%
Natural sciences	198,600	166,700	14,100	17,800	83.9%	7.1%	9.0%
Social sciences	214,100	180,300	17,560	16,300	84.2%	8.2%	7.6%
Other	561,300	472,700	37,510	51,100	84.2%	6.7%	9.1%

SOURCE: U.S. Department of Education, National Center for Education Statistics, Teacher Follow-up Survey (TFS), Current and Former Teacher Data Files, 2008–09; Teacher Attrition and Mobility: Results from the 2004–05 Teacher Follow-up Survey, U.S. Department of Education, National Center for Education Statistics (NCES 2007-307).

Table 3

Attrition Rates by Year for Various Job Categories and All Non-Farm Employees

Job Category	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Mean
Education	12.9	12.3	13.5	12.9	14.1	15.3	14.1	12.6	10.1	11.0	12.9
Healthcare	25.0	21.8	20.7	21.2	22.7	22.5	21.6	19.2	16.0	15.3	20.6
Professional	38.4	37.3	29.2	30.8	33.0	34.1	32.3	28.5	19.8	22.9	30.6
Total Non-Farm	27.6	24.8	22.6	24.2	26.2	26.7	25.5	21.9	15.7	16.4	23.2

SOURCE: U.S. Department of Labor, Bureau of Labor Statistics, Job Openings and Labor Turnover Survey (JOLTS). Retrieved from: http://www.bls.gov/jlt/data.htm (05/11)

Table 4

Comparison of Induction Program Retention Rates and Percent Decreases in Attrition

Program	Length	1 year	2 years	5 years	% Δ	Norm	*r*
BTSA(Statewide) - CA	2	93.0[r]	89.3[r]	79.0[r]	62.8[p]	94.4	-0.6533
Newport Mesa	2	96.6	93.3[p]	84.1[p]	80.0	97.0	
Stanislaus	2	91.1	83.0[p]	62.7[p]			
Clark County, NV	3	92.5	85.6[p]	67.7[p]	71.0	95.7	
CMP STIR - CA	1	89.9[a]	80.9[p]	58.8[p]	49.5	92.4	
Connecticut BEST*	2-3	91.1	84.1[r]	65.4			-0.9998
Flowing Wells, AZ	4	87.2[r]	83.9[r]	74.8[r]	75.8	96.4	-0.8582
Glendale, AZ	3	86.9[r]	80.3[r]	63.4[r]	71.7	95.8	-0.6964
Homewood, IL	2	99.0	98.0[p]	95.1[p]	98.4	99.8	
Islip, NY	3	87.3[w]	76.2[p]	50.7[p]	88.1	97.3	
Lafourche, LA	3	91.0[a]	82.8[p]	62.4[p]	81.7	97.3	
Leyden, IL	N/A	95.6	91.4[p]	79.9[p]			
Montana BTSP*	1	90.9[w]	68.4[w]	50.6[r]	48.3	92.2	-0.9235
Muscatine, IA	2	93.0	86.0	70.0[r]			-0.9986
MUSE – HI	2-3	89.0	79.2[p]	55.8[p]	60.0	94	
Oconee, GA	2	96.3[r]	89.7[r]	72.6[r]			-0.8539
Odell & Ferraro - NM	N/A	95.7[p]	91.7[p]	80.4[p]	49.0	92.4	
Prince George, MD	2	92.8	86.1[p]	68.8[p]			
Rochester, NY	3	88.0[a]	77.4[p]	52.8[p]	70.0	95.5	
South TX	3	89.0[w]	74.6[w]	57.0[r]	72.9	95.9	-0.9598
St. Louis, MO	3-5	91.4[w]	83.5[p]	63.8[p]	67.0	95.1	
Texas BESS*	1	89.2	84.4	64.8[r]	43.8	91.6	-0.9804
Medians	2.4	91.1	84.0	65.1	70.5	95.6	
National Averages		85.0	72.3[C]	44.4[C]			

Note. Length is in years. * = Canceled programs. [a] = Average of rates. [w] = Weighted mean. [p] = Computed with simple powers. [r] = Regressed rate. Rates without any markings are single year results. Norm = Yearly rate normalized to national average rate of 85%.

Table 5

Flowing Wells Cumulative Retention Rates and Percentages through the 2010-2011 Academic Year

Academic year	Retention rate	Estimated yearly rate	Approximated rate
1999-2000	12/55 (22%)	88%	61% - 74%
2000-2001	8/45 (18%)	86%	59% - 73%
2001-2002	2/22 (9%)	79%	55% - 70%
2002-2003	12/25 (48%)	92%	74% - 83%
2003-2004	7/33 (21%)	82%	61% - 74%
2004-2005	16/46 (35%)	86%	68% - 78%
2005-2006	21/44 (48%)	88%	74% - 83%
2006-2007	23/57 (40%)	83%	70% - 80%
2007-2008	28/56 (50%)	84%	75% - 83%
2008-2009	23/45 (51%)	80%	76% - 84%
2009-2010	13/20 (65%)	81%	83% - 88%

Note. "Approximated rate" is 1/2 to 2/3 of the Leavers added back as assumed Movers.

Table 6

Montana Beginning Teacher Support Program (BTSP) Retention Rates

	1992-93 Mentees	1993-94 Mentees	1993-94 Control	1994-95 Mentees	1994-95 Control
N	11	12	11	12	10
After One Year					
Original District	9	9	7	12	7
Another District	2	1	1	--	--
Seeking Teaching	--	1	3	--	1
Grad School	--	1	--	--	--
Not Teaching	--	--	--	--	2
Percent Active	100%	83%	73%	100%	70%
After Two Years					
Original District	8	5	6	n/a	n/a
Another District	3	3	2		
Seeking Teaching	--	2	2		
Grad School	--	2	--		
Not Teaching	--	--	1		
Percent Active	100%	67%	73%		
After Three Years					
Original District	7	n/a	n/a	n/a	n/a
Another District	3				
Seeking Teaching	1				
Grad School	--				
Not Teaching	--				
Percent Active	91%				

Note. Percent Active = "Original District" + "Another District" only. No "Control" group used for 1992-93.

Table 7

Oconee Number and Percentage of Beginning Teachers Still Teaching in 2008

Year	Number hired	Teaching in Oconee	Percent in Oconee	Teaching elsewhere	Percent teaching
2001-02	16	9	56%	4	81%
2002-03	12	9	75%	3	100%
2003-04	9	8	89%	1	100%
2004-05	16	12	75%	4	100%
2005-06	25	22	88%	2	96%
2006-07	25	25	100%	0	100%
2007-08	15	14	93%	1	100%
Totals/Averages	118	99	84%	15	97%

Note. "Percent teaching" is the total percentage of new hires still teaching anywhere.

Table 8

South Texas School Districts Percentage of Teachers Who Plan to Continue Teaching Based Upon Years of Teaching and Whether or Not They Had a Mentor During Induction

Years of experience	Continue	Leave
First year of teaching with mentor (N = 60)	90%	10%
First year of teaching – no mentor (N = 38)	61%	39%
Second year of teaching with mentor (N = 23)	78%	22%
Second year of teaching – no mentor (N = 32)	63%	37%
Third year of teaching with mentor (N = 32)	72%	28%
Third year of teaching – no mentor (N = 33)	73%	27%

Table 9

South Texas School Districts Percentage of Beginning Teachers Who Plan to Continue Teaching Based Upon the Amount of Time They Spent with Their Mentor During Induction

Hours per week	Continue	Leave
Less than 1 (*N* = 62)	76%	24%
1 to 3 (*N* = 39)	90%	10%
More than 3 (*N* = 20)	90%	10%
Total respondents with a mentor (*N* = 121)	83%	17%
Total respondents without a mentor (*N* = 107)	66%	34%

Table 10

Frequencies and Percentages of Most Commonly Mentioned Induction Components

Component	Freq	Percent
Experienced Mentor	52	100%
Experienced Mentor in the same subject area and grade level	(33)	(63%)
Collaboration with other teachers / Common planning time	31	60%
Sustained, structured, self-guided Professional Development	30	58%
Support from Principal/administration	26	50%
Observe mentor and/or veteran teachers teaching	23	44%
Be observed while teaching by mentor or expert teachers	22	42%
Release time to allow for regular meetings, seminars etc.	16	31%
Reduced teaching load and/or administrative duties	15	29%
Release time or Reduced teaching load	(17)	(33%)
Networking with outside organizations (University faculty etc.)	13	25%

Table 11

Unweighted and Base-Weighted Response Rates by Stage of Data Collection, by Wave and Type of Weighting: 2007-08 through 2009-10 Data Waves

Response rate	BTLS wave	2007-08 SASS Teacher Listing Form	2007-08 SASS school teachers with 1 to 3 years of experience	Overall response rate
First wave				
Unweighted	N/A	86.7	74.6	73.4
Base-weighted	N/A	86.2	84.3	72.7
Second wave without retrospective cases				
Unweighted	84.7	86.7	84.6	62.1
Base-weighted	84.5	86.2	84.3	61.4
Second wave with retrospective cases				
Unweighted	91.8	86.7	84.6	67.4
Base-weighted	91.9	86.2	84.3	66.8
Third wave				
Unweighted	86.2	86.7	84.6	63.3
Base-weighted	86.1	86.2	84.3	62.5

Note. Retrospective cases are respondents that were non-interviews during the second wave, but provided replies to second wave items during third wave interviews. Base-weighted response rates use the inverse of the probability of selection and the sampling adjustment factor.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Beginning Teacher Longitudinal Study (BTLS), "First through Third Wave Preliminary Data File," 2007-08, 2008-09, 2009-10.

Table 12

Range of Item Response Rates and Percentage of Items with Selected Rate Ranges, by Wave and Type of Weighting: 2007-08 through 2009-10 Data Waves

Wave and type of weighting	Range of item response rate	Percentage of items with a response rate of 85.0% or more	Percentage of items with a response rate of 70.0% - 84.9%	Percentage of items with a response rate of less than 70.0%
First wave				
Unweighted	0.0 - 100.0	82.5	10.1	7.4
Base-weighted	0.0 - 100.0	83.3	8.9	7.8
Second wave without retrospective cases				
Unweighted	4.3 – 100.0	87.2	8.5	4.3
Base-weighted	3.8 – 100.0	86.8	8.9	4.3
Second wave with retrospective cases				
Unweighted	4.3 – 100.0	87.8	7.8	4.4
Base-weighted	3.9 – 100.0	87.8	7.8	4.4
Third wave				
Unweighted	0.0 – 100.0	84.3	12.2	3.5
Base-weighted	0.0 – 100.0	84.7	11.8	3.5

Note. Retrospective cases are respondents that were non-interviews during the second wave, but provided replies to second wave items during third wave interviews. Base-weighted response rates use the inverse of the probability of selection and the sampling adjustment factor. Final-weighted response rates use an initial basic weight, a SASS teacher weighting adjustment factor, a non-interview adjustment factor, and a ratio adjustment factor. Detail may not sum to totals due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Beginning Teacher Longitudinal Study (BTLS), "First through Third Wave Preliminary Data File," 2007-08, 2008-09, 2009-10.

Table 13

A Comparison of the Most Commonly Mentioned Induction Components in the Literature to the Selection of Components in Successful Programs with Reduced Attrition Rates

	Frequency(%)	
Characteristic	Lit Rev	Success
Experienced Mentor in the same subject area and grade level	52(100)	22(100)
Collaboration with other teachers / Common planning time	31(60)	22(100)
Sustained, structured, self-guided Professional Development	30(58)	22(100)
Support from Principal/administration	26(50)	22(100)
Observe mentor and/or veteran teachers teaching	23(44)	17(77)
Be observed while teaching by mentor or expert teachers	22(42)	17(77)
Release Time to allow for regular meetings, seminars etc.	16(31)	11(50)
Reduced teaching load and/or administrative duties	15(29)	11(50)
Networking with outside organizations (University faculty etc.)	13(25)	14(64)

Table 14

Frequencies and Relative Frequencies of Employment Status Variables

	Unweighted		Weighted	
Variable Name (missing) - Description	Freq	Rel Freq	Freq	Rel Freq
W2STTUS (163) - Yr 2 Employment Status				
1=Leavers	190	10.39	15479.16	9.91
2=Stayers	1347	73.65	116007.70	74.25
3=Movers	292	15.97	24742.00	15.84
W3STTUS (274) - Yr 3 Employment Status				
1=Leavers	234	13.62	19534.59	12.47
2=Stayers	1247	72.58	116457.10	74.36
3=Movers	198	11.53	16248.29	10.37
4=Returners	39	2.27	4376.77	2.79

Table 15

Frequencies and Relative Frequencies of Variables Used in Research Question 2

	Unweighted		Weighted	
Variable Name (missing) - Description	Freq	Rel Freq	Freq	Rel Freq
W1T0220 (92) - Induction Program				
1=Yes	1360	71.58	120068.00	80.24
0=No	540	28.42	29572.29	19.76
W1T0221 (62) - Reduced Schedule / Preps				
1=Yes	327	16.94	23240.97	15.18
0=No	1603	83.06	129843.80	84.82
W1T0222 (63) - Common Planning Time				
1=Yes	998	51.74	96359.35	62.95
0=No	931	48.26	56725.38	37.05
W1T0223 (63) - Seminars or Classes				
1=Yes	1383	71.70	122596.70	80.08
0=No	546	28.30	30488.06	19.92
W1T0224 (63) - Extra Help (Teacher Aide)				
1=Yes	592	30.69	46556.33	30.41
0=No	1337	69.31	106528.40	69.59
W1T0225 (64) - Supportive Admin				
1=Yes	1684	87.34	133920.60	87.51
0=No	244	12.66	19120.34	12.49
W1T0226 (64) - Ongoing Mentor Guidance				
1=Yes	1568	81.33	129019.10	84.30
0=No	360	18.67	24021.84	15.70
INDUCT - Combinations of W1T0221-226				
4=All 6	83	4.17	6760.71	4.33
3=(2,3,5,6)	339	17.02	38431.50	24.60
2=(3,5,6)	270	13.55	18486.15	11.83
1=(3&5)	37	1.86	2184.97	1.40
0=None	50	2.51	2632.97	1.69
_=Other (includes blanks)	1213	60.89	87732.57	56.16
INDUCT2 - W1T0223 & 225 vs. Others				
1=At least 3&5	1263	63.40	111490.40	71.36
0=Other (includes blanks)	729	36.60	44738.51	28.64

Note. Numbers in parenthesis after the variable name represent the number of missing data.

Table 16

Frequencies and Relative Frequencies of Variables Used in Research Question 3

	Unweighted		Weighted	
Variable Name (missing) - Description	Freq	Rel Freq	Freq	Rel Freq
W2MNTYN (162) - Mentor in First Year				
1=Yes	1433	78.31	125776.90	80.51
0=No	397	21.69	30451.95	19.49
MENTIND (243) - Inducting & Mentoring				
3=Both	1096	62.66	102661.30	68.61
2=Induct only	169	9.66	17406.74	11.63
1=Mentor only	279	15.95	18149.73	12.13
0=Neither	205	11.72	11422.56	7.63
W2MNGRA (753) - Teaches Same Grade				
1=Yes	1080	87.17	88235.42	81.70
0=No	159	12.83	19760.89	18.30
W2MNSUB (750) - Teaches Same Subject				
1=Yes	879	70.77	82328.71	75.53
0=No	363	29.23	26677.18	24.47
MNGRASUB (755) - Grade & Subject				
3=Both	791	63.95	69498.35	64.37
2=Subject only	85	6.87	11983.84	11.10
1=Grade only	287	23.20	18701.14	17.32
0=Neither	74	5.98	7777.05	7.20
W2MNFRQ (748) - Meeting Frequency				
3=Once/week	620	49.84	58553.49	53.70
2=1or2/month	354	28.46	27533.48	25.25
1=Few/year	219	17.60	16707.19	15.32
0=Never	51	4.10	6235.01	5.72
W2MNOBS (752) - Observation Freq				
3=Once/week	122	9.84	12329.17	11.35
2=1or2/month	260	20.97	20517.83	18.89
1=Few/year	539	43.47	49091.19	45.19
0=Never	319	25.73	26700.55	24.58
W2MNIMP (754) - Teaching Improvement				
3=Great extent	328	26.49	29634.74	27.25
2=moderately	409	33.04	38780.72	35.67
1=Small extent	380	30.69	27479.72	25.27
0=Not at all	121	9.77	12838.67	11.81

Note. Numbers in parenthesis after the variable name represent the number of missing data.

Table 17

Weighted Two Way Frequencies of Year Two (2008-09) Teacher Employment Status W2STTUS used for Research Question 2 on Induction Components

	Leaver		Stayer		Mover	
Variable Name	*N*	%	*N*	%	*N*	%
W1T0220 - Induction						
1=Yes	10576	8.81	90126	75.06	19367	16.13
0=No	4566	15.44	19974	67.54	5032	17.01
W1T0221 - Less Preps						
1=Yes	2284	9.83	17104	73.59	3853	16.58
0=No	12974	9.99	96233	74.11	20637	15.89
W1T0222 - Common Planning						
1=Yes	8998	9.34	72240	74.97	15122	15.69
0=No	6260	11.04	41097	72.45	9368	16.51
W1T0223 - Seminars						
1=Yes	10540	8.60	93300	76.10	18756	15.30
0=No	4718	15.48	20037	65.72	5733	18.80
W1T0224 - Extra Help						
1=Yes	4000	8.59	33735	72.46	8822	18.95
0=No	11258	10.57	79602	74.72	15668	14.71
W1T0225 - Admin Support						
1=Yes	11903	8.89	101632	75.89	20386	15.22
0=No	3356	17.55	11661	60.99	4103	21.46
W1T0226 - Mentor Feedback						
1=Yes	10510	8.36	95151	75.65	20116	15.99
0=No	4969	16.32	20857	68.49	4626	15.19
INDUCT						
4=All 6	401	5.93	4834	71.51	1525	22.56
3=(2,3,5,6)	3986	10.37	28182	73.33	6263	16.30
2=(3,5,6)	1076	5.82	15016	81.23	2395	12.96
1=(3&5)	127	5.81	1610	73.69	448	20.50
0=None	803	30.50	1336	50.76	493	18.74
_=Other	9086	10.36	65029	74.12	13617	15.52
INDUCT2						
1=>3&5	8471	7.60	86350	77.45	16669	14.95
0=Other	7008	15.66	29658	66.29	8073	18.04

Note. INDUCT & INDUCT2 are variables created by the author.

Table 18

Weighted Two Way Frequencies of Year Three (2009-10) Teacher Employment Status W3STTUS used for Research Question 2 on Induction Components

	Leaver		Stayer		Mover		Returner	
Variable	*N*	%	*N*	%	*N*	%	*N*	%
W1T0220 - Induction								
1=Yes	12894	10.71	92857	77.10	11176	9.28	3515	2.92
0=No	5940	20.06	18809	63.52	4207	14.21	653	2.21
W1T0221 - Less Preps								
1=Yes	3411	14.34	17949	75.46	2193	9.22	231	0.97
0=No	15507	11.95	96603	74.46	13693	10.55	3937	3.03
W1T0222 - Planning								
1=Yes	11156	11.51	75371	77.76	7627	7.87	2778	2.87
0=No	7761	13.71	39182	69.23	8259	14.59	1390	2.46
W1T0223 - Seminars								
1=Yes	12358	10.10	95105	77.70	11386	9.30	3546	2.90
0=No	6559	21.07	19448	62.47	4500	14.46	623	2.00
W1T0224 - Extra Help								
1=Yes	5795	11.80	35388	72.07	5891	12.00	2029	4.13
0=No	13122	12.57	79165	75.81	9995	9.57	2140	2.05
W1T0225 - Admin								
1=Yes	14822	11.09	101687	76.10	14022	10.49	3099	2.32
0=No	4096	20.63	12824	64.59	1864	9.39	1070	5.39
W1T0226 - Mentor								
1=Yes	15250	11.77	96398	74.42	13925	10.75	3954	3.05
0=No	3668	15.31	18113	75.60	1962	8.19	215	0.90
INDUCT								
4=All 6	999	13.16	5463	71.95	1120	14.76	11	0.14
3=(2,3,5,6)	3018	8.26	30127	82.44	2063	5.64	1336	3.66
2=(3,5,6)	1830	10.32	13623	76.83	2255	12.72	22	0.13
1=(3&5)	107	5.24	1767	86.79	162	7.97	0	0.00
0=None	1129	39.30	1376	47.92	367	12.77	0	0.00
_=Other	12452	13.86	64101	71.35	10281	11.44	3008	3.35
INDUCT2								
1=>3&5	10576	9.52	87714	78.96	10243	9.22	2547	2.29
0=Other	8959	19.67	28744	63.12	6005	13.19	1829	4.02

Note. INDUCT & INDUCT2 are variables created by the author.

Table 19

Chi Square Test of Association for Induction Program Variables and Teacher Employment Status Variables used for Research Question 2

	Year 2				Year 3			
Variable	*df*	χ^2	*p*	*V*	*df*	χ^2	*p*	*V*
W1T0220 - Induction	2	1225.34	0.0001	0.0905	3	2852.58	0.0001	0.1379
W1T0221 - Less Preps	2	7.02	0.0299	0.0068	3	444.83	0.0001	0.0538
W1T0222 - Planning	2	148.98	0.0001	0.0312	3	2072.60	0.0001	0.1162
W1T0223 - Seminars	2	1702.21	0.0001	0.1054	3	3907.36	0.0001	0.1595
W1T0224 - Extra Help	2	513.78	0.0001	0.0579	3	801.40	0.0001	0.0722
W1T0225 - Admin	2	2167.81	0.0001	0.1190	3	2202.62	0.0001	0.1198
W1T0226 - Mentor	2	156.43	0.0001	0.0320	3	682.67	0.0001	0.0667
INDUCT	8	2317.28	0.0001	0.1301	12	5082.08	0.0001	0.1593
INDUCT2	2	2824.99	0.0001	0.1345	3	4592.73	0.0001	0.1712

Table 20

Weighted Two Way Frequencies of Year Two (2008-09) Teacher Employment Status W2STTUS used for Research Question 3 on Mentoring Components

	Leaver		Stayer		Mover	
Variable Name	*N*	%	*N*	%	*N*	%
W2MNTYN - Mentor						
1=Yes	10510	8.36	95151	75.65	20116	15.99
0=No	4969	16.32	20857	68.49	4626	15.19
W2MNGRA - Teach Grade						
1=Yes	6719	7.61	68619	77.77	12898	14.62
0=No	1335	6.76	14456	73.15	3970	20.09
W2MNSUB - Teach Subject						
1=Yes	6032	7.33	64467	78.30	11830	14.37
0=No	2201	8.25	19417	72.79	5059	18.96

	Leaver		Stayer		Mover	
Variable Name	*N*	%	*N*	%	*N*	%
MNGRASUB						
3=Both	5513	7.93	54221	78.02	9765	14.05
2=Subject only	519	4.33	9421	78.61	2044	17.06
1=Grade only	1206	6.45	14362	76.80	3133	16.75
0=Neither	816	10.49	5035	64.74	1926	24.77
W2MNFRQ - Meet Frequency						
3=Once/week	3797	6.48	46624	79.63	8133	13.89
2=1or2/month	2744	9.97	18742	68.07	6047	21.96
1=Few/year	1121	6.71	13199	79.00	2387	14.29
0=Never	549	8.80	5365	86.04	322	5.16
W2MNOBS - Observation Freq						
3=Once/week	1022	8.29	9955	80.75	1352	10.96
2=1or2/month	1208	5.89	15636	76.21	3674	17.91
1=Few/year	3681	7.50	36854	75.07	8556	17.43
0=Never	2091	7.83	21303	79.78	3307	12.39
W2MNIMP - Teaching Improve						
3=Great extent	1293	4.36	25804	87.07	2537	8.56
2=moderately	2093	5.40	28546	73.61	8142	20.99
1=Small extent	2943	10.71	20724	75.42	3813	13.88
0=Not at all	1822	14.19	8652	67.39	2365	18.42
MENTIMP						
1=High (3+4)	3386	4.95	54350	79.44	10679	15.61
0=Low (1+2)	4764	11.82	29376	72.86	6178	15.32
MENTIND						
3=Both	7814	7.61	78092	76.07	16755	16.32
2=Induct only	2762	15.87	12033	69.13	2612	15.00
1=Mentor only	2401	13.23	12586	69.34	3163	17.43
0=Neither	2165	18.95	7389	64.69	1869	16.36

Table 21

Weighted Two Way Frequencies of Year Three (2009-10) Teacher Employment Status W3STTUS used for Research Question 3 on Mentoring Components

	Leaver		Stayer		Mover		Returner	
Variable	*N*	%	*N*	%	*N*	%	*N*	%
W2MNTYN - Mentor								
1=Yes	12243	9.79	96769	77.37	12807	10.24	2356	2.60
0=No	6862	22.54	19159	62.93	3301	10.84	1121	3.68
W2MNGRA - Teach Grade								
1=Yes	7396	8.37	69062	78.18	9622	10.89	2254	2.55
0=No	1780	8.92	16471	82.58	1243	6.23	450	2.26
W2MNSUB - Teach Subject								
1=Yes	5819	6.98	68228	81.81	6802	8.16	2552	3.06
0=No	3600	13.85	18175	69.93	4064	15.63	152	0.59
MNGRASUB								
3=Both	5445	7.77	56301	80.31	6212	8.86	2142	3.06
2=Subject only	374	3.01	11052	88.95	589	4.74	411	3.31
1=Grade only	1951	10.72	12721	69.92	3409	18.74	113	0.62
0=Neither	1406	18.70	5419	72.07	654	8.70	39	0.53
W2MNFRQ - Meet Freq								
3=Once/week	3841	6.46	49368	83.01	4362	7.33	1904	3.20
2=1or2/month	3286	12.13	19962	73.71	3288	12.14	546	2.02
1=Few/year	1734	10.43	12957	77.93	1774	10.67	162	0.97
0=Never	558	8.91	4166	66.57	1441	23.03	93	1.49
W2MNOBS - Observe Freq								
3=Once/week	879	6.81	10585	81.92	1085	8.40	372	2.88
2=1or2/month	2508	11.92	16656	79.18	1811	8.61	60	0.29
1=Few/year	3524	7.26	38378	79.10	4880	10.06	1738	3.58
0=Never	2207	8.31	20727	78.04	3090	11.63	535	2.01
W2MNIMP - Teach Improve								
3=Great extent	2143	7.27	25106	85.19	1820	6.18	403	1.37
2=moderately	2301	5.87	31419	80.18	4625	11.80	842	2.15
1=Small extent	3537	12.60	21986	78.30	1972	7.02	582	2.07
0=Not at all	1344	10.87	7733	62.55	2409	19.48	878	7.10

Variable	Leaver		Stayer		Mover		Returner	
	N	%	*N*	%	*N*	%	*N*	%
MENTIMP								
1=High (3+4)	4444	6.47	56524	82.33	6445	9.39	1244	1.81
0=Low (1+2)	4881	12.07	29719	73.49	4381	10.83	1460	3.61
MENTIND								
3=Both	9139	8.96	81075	79.52	9090	8.92	2649	2.60
2=Induct only	3597	20.35	11271	63.75	1947	11.01	866	4.90
1=Mentor only	2800	15.41	12073	66.43	2852	15.69	448	2.47
0=Neither	2868	25.72	6722	60.29	1355	12.15	205	1.84

Table 22

Chi square Test of Association for Mentoring Variables and Teacher Employment Status

Variables used for Research Question 3

Variable	Year 2				Year 3			
	df	χ^2	*p*	*V*	*df*	χ^2	*p*	*V*
W2MNTYN - Mentor	2	1747.25	0.0001	0.1058	3	4036.08	0.0001	0.1611
W2MNGRA - Grade	2	370.53	0.0001	0.0586	3	403.21	0.0001	0.0610
W2MNSUB - Subject	2	376.98	0.0001	0.0588	3	3048.04	0.0001	0.1669
MNGRASUB - Both	6	1022.05	0.0001	0.0688	9	4244.29	0.0001	0.1143
W2MNFRQ - Meeting	6	2030.05	0.0001	0.0965	9	3071.01	0.0001	0.0967
W2MNOBS - Observe	6	682.68	0.0001	0.0561	9	1266.11	0.0001	0.0622
W2MNIMP - Improve	6	4166.10	0.0001	0.1384	9	4758.86	0.0001	0.1206
MENTIMP	2	1740.21	0.0001	0.1265	3	1570.20	0.0001	0.1200
MENTIND	6	2593.09	0.0001	0.0931	9	5780.83	0.0001	0.1137

Table 23

Logistic Regression Model for Predicting New Teacher Employment Status in Year Two

Variable	*B*	SE	Wald χ^2	β	OR	95%CI (OR)
W2MNTYN assigned a mentor	0.7383	0.0213	1196.1746	1.4866	2.092	2.007, 2.182
W1T0225 supportive admin	0.8062	0.0238	1151.8299	1.3331	2.239	2.138, 2.346
W1T0220 induction program	0.3512	0.0219	256.1514	0.7141	1.421	1.361, 1.483
W1T0226 ongoing guidance	-0.3879	0.0260	222.4735	-0.7198	0.678	0.645, 0.714
W1T0223 seminars	0.3204	0.0223	206.8771	0.6506	1.378	1.319, 1.439
W1T0224 extra assistance	0.2424	0.0199	148.1764	0.5710	1.274	1.226, 1.325
W1T0222 common planning	-0.1459	0.0193	57.2631	-0.3603	0.864	0.832, 0.898
W1T0221 reduced schedule	-0.1254	0.0246	25.9898	-0.2307	0.882	0.841, 0.926

Note: Variables are in the order in which they entered the model during forward selection. CI = confidence interval for odds ratio (OR).

Table 24

Predicted Probabilities of New Teacher Employment Status in Year Two for Combinations of Induction Program Components

W1T0220 Induction Program	W2MNTYN Mentor	W1T0225 Supportive Admin	W1T0223 Seminars	Odds Ratio	Probability of Employment	Percent Increase
Yes	Yes	Yes	Yes	9.172	95.32%	38.26%
Yes	Yes	Yes	No	6.658	93.66%	35.86%
Yes	Yes	No	Yes	4.096	90.09%	30.68%
Yes	Yes	No	No	2.973	86.84%	25.96%
Yes	No	Yes	Yes	4.383	90.68%	31.53%
Yes	No	Yes	No	3.182	87.60%	27.06%
Yes	No	No	Yes	1.957	81.29%	17.91%
Yes	No	No	No	1.421	75.93%	10.13%
No	Yes	Yes	Yes	6.456	93.48%	35.59%
No	Yes	Yes	No	4.686	91.23%	32.33%
No	Yes	No	Yes	2.883	86.49%	25.45%
No	Yes	No	No	2.092	82.28%	19.35%
No	No	Yes	Yes	3.085	87.26%	26.57%
No	No	Yes	No	2.239	83.25%	20.75%
No	No	No	Yes	1.378	75.36%	9.31%
No	No	No	No	1.000	68.94%	

Note: percent increase is comparing the probability of employment from the model to the modeled intercept of 68.94%.

Table 25

Logistic Regression Model for Predicting New Teacher Employment Status in Year Three

Variable	*B*	SE	Wald χ^2	β	OR	95%CI (OR)
W2MNTYN assigned a mentor	0.8841	0.0195	2062.8426	1.8404	2.421	2.330, 2.515
W1T0223 seminars	0.5690	0.0201	803.0444	1.2037	1.766	1.698, 1.837
W1T0225 supportive admin	0.7140	0.0224	1013.5144	1.2359	2.042	1.954, 2.134
W1T0221 reduced schedule	-0.3714	0.0216	294.4857	-0.7096	0.690	0.661, 0.720
W1T0226 ongoing guidance	-0.4103	0.0241	289.1433	-0.7834	0.663	0.633, 0.696
W1T0220 induction program	0.3104	0.0201	238.0156	0.6504	1.364	1.311, 1.419
W1T0222 common planning	-0.1302	0.0180	52.5876	-0.3314	0.878	0.848, 0.909
W1T0224 extra assistance	0.0558	0.0176	10.0097	0.1373	1.057	1.021, 1.095

Note: Variables are in the order in which they entered the model during forward selection. CI = confidence interval for odds ratio (OR).

Table 26

Predicted Probabilities of New Teacher Employment Status in Year Three for Combinations of Induction Program Components

W1T0220 Induction Program	W2MNTYN Mentor	W1T0225 Supportive Admin	W1T0223 Seminars	Odds Ratio	Probability of Employment	Percent Increase
Yes	Yes	Yes	Yes	11.912	95.16%	53%
Yes	Yes	Yes	No	6.744	91.76%	47%
Yes	Yes	No	Yes	5.833	90.60%	45%
Yes	Yes	No	No	3.302	84.51%	36%
Yes	No	Yes	Yes	4.921	89.05%	43%
Yes	No	Yes	No	2.786	82.15%	32%
Yes	No	No	Yes	2.410	79.92%	28%
Yes	No	No	No	1.364	69.26%	11%
No	Yes	Yes	Yes	8.733	93.52%	50%
No	Yes	Yes	No	4.944	89.09%	43%
No	Yes	No	Yes	4.276	87.60%	41%
No	Yes	No	No	2.421	80.00%	28%
No	No	Yes	Yes	3.607	85.63%	37%
No	No	Yes	No	2.042	77.13%	24%
No	No	No	Yes	1.767	74.48%	20%
No	No	No	No	1.000	62.29%	

Note: percent increase is comparing the probability of employment from the model to the modeled intercept of 62.29%.

Figures

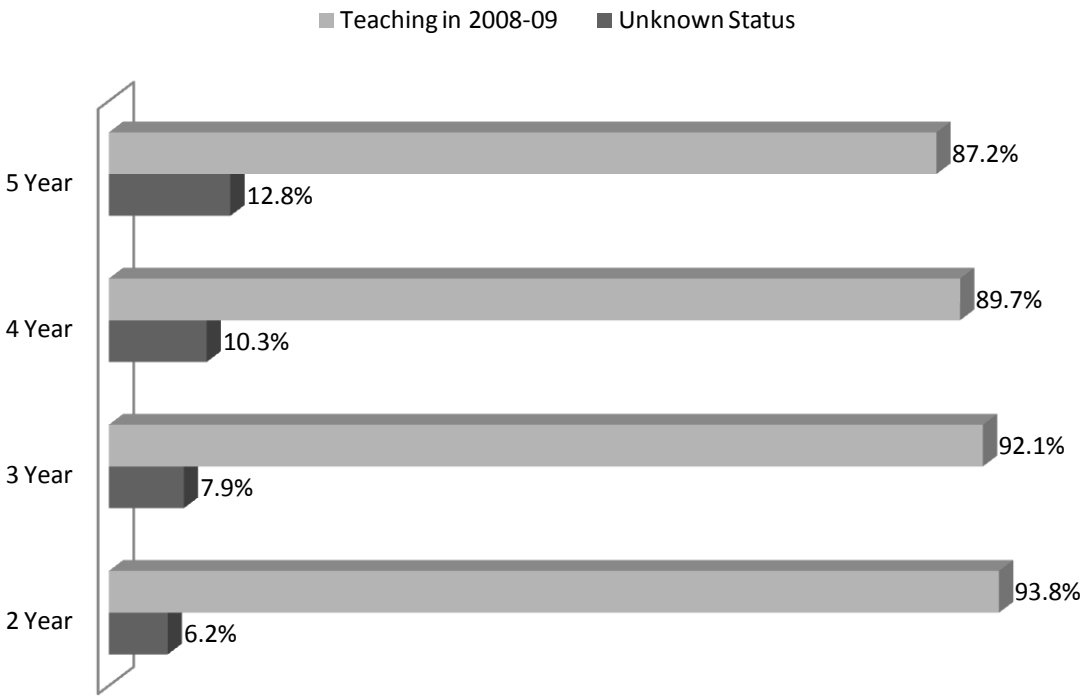

Figure 1. BTSA statewide retention rates over a five-year span for academic years 2004 through 2008. The Teaching category (lighter shade) includes those teachers (1% per year on average) that moved into leadership positions such as principal or into pupil service positions such as librarian or counselor. CTC Statistic of the Month December 2008 retrieved from http://www.ctc.ca.gov/educator-prep/statistics-archive.html

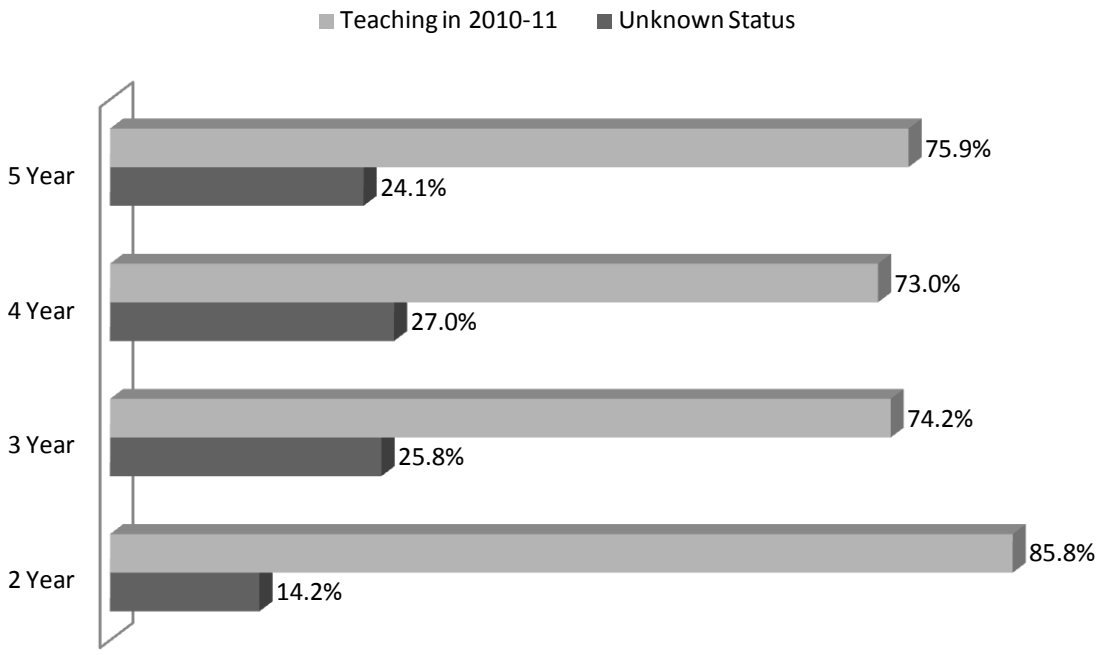

Figure 2. BTSA statewide retention rates over a five-year span for academic years 2006 through 2010. The Teaching category (lighter shade) includes (1% per year on average) those teachers that moved into leadership positions such as principal or into pupil service positions such as librarian or counselor. CTC Statistic of the Month February 2011 retrieved from http://www.ctc.ca.gov/educator-prep/statistics.html

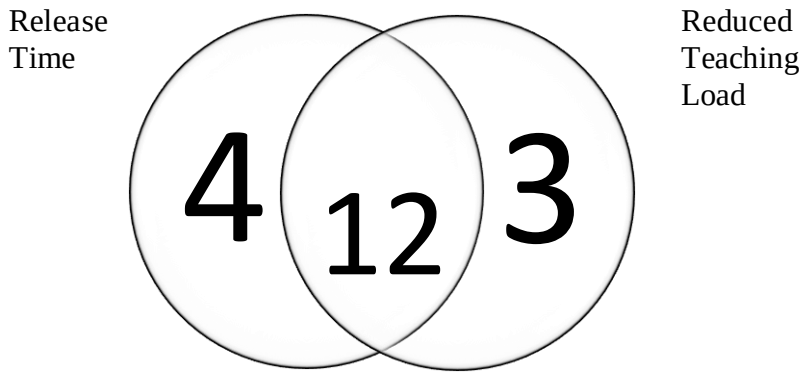

Figure 3. Venn diagram illustrating the overlap of sources mentioning release time as an induction characteristic versus those mentioning a reduced teaching load.

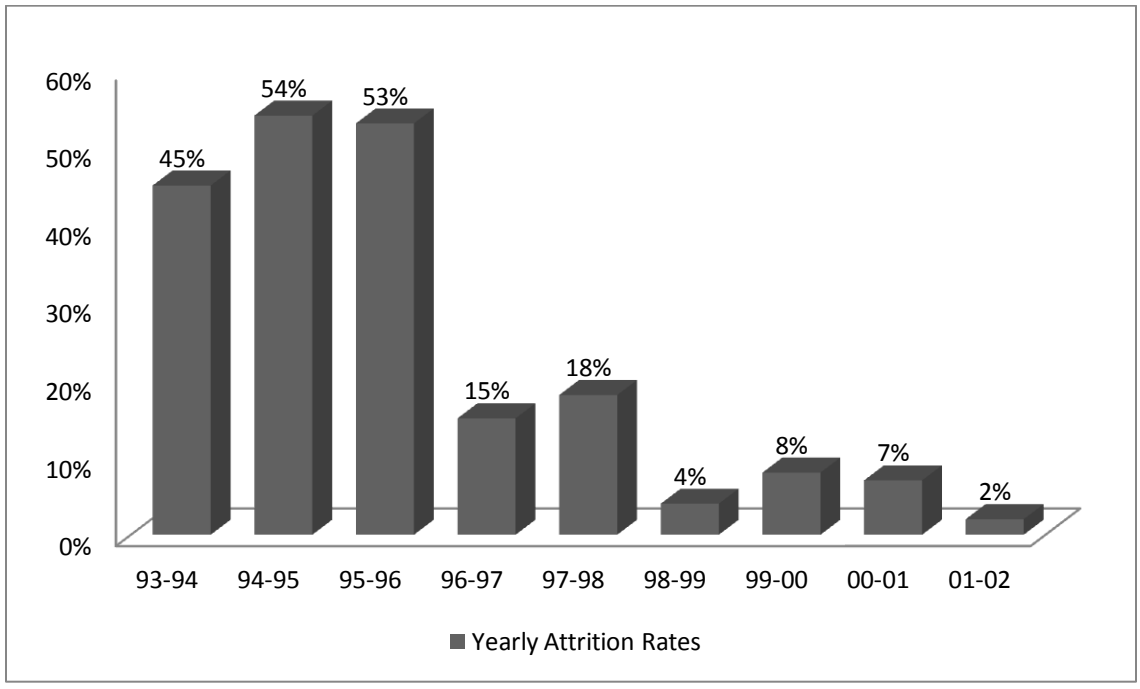

Figure 4. New teacher attrition rates in Lafourche Parish Public Schools by school year from 1993 to 2002.

Appendix A

Following is a listing of all variables used in this report along with their descriptions. The descriptions came directly from the documentation provided with the NCES datasets, and the variable responses are in parentheses at the end of each description. The "Survey Item" column lists the survey question that corresponds to the variable. "NCES created" refers to created variables provided by NCES, and "Created" refers to variables that I created to facilitate analyses. Variables with an asterisk are ordinal, and all other variables except for the weighting variables are nominal.

Variable	**Survey Item**	**Description & Item Response Options**
W1T0220	SASS 38	In your FIRST year of teaching, did you participate in a teacher induction program? (1=Yes, 0=No)
W1T0221	SASS 39a	Did you receive the following kinds of support during your FIRST year of teaching? Reduced teaching schedule or number of preparations (1=Yes, 0=No)
W1T0222	SASS 39b	Did you receive the following kinds of support during your FIRST year of teaching? Common planning time with teachers in your subject (1=Yes, 0=No)
W1T0223	SASS 39c	Did you receive the following kinds of support during your FIRST year of teaching? Seminars or classes for beginning teachers (1=Yes, 0=No)
W1T0224	SASS 39d	Did you receive the following kinds of support during your FIRST year of teaching? Extra classroom assistance (e.g., teacher aides) (1=Yes, 0=No)
W1T0225	SASS 39e	Did you receive the following kinds of support during your FIRST year of teaching? Regular supportive communication with your principal, other administrators, or department chair (1=Yes, 0=No)

W1T0226	SASS 39f	Did you receive the following kinds of support during your FIRST year of teaching? Ongoing guidance or feedback from a master or mentor teacher (1=Yes, 0=No)
W2MNFRQ*	TFS 18e/8e	How frequently did you work with your master or mentor teacher during the 2007-08 school year? (3=At least once a week, 2=Once or twice a month, 1=A few times a year, 0=Never)
W2MNGRA	TFS 18d/8d	Has your master or mentor teacher ever instructed students in the same grade level(s) as yours? (1=Yes, 0=No)
W2MNIMP*	TFS 20/10	Overall, to what extent did your assigned master or mentor teacher improve your teaching last school year (2007-08)? (0=Not at all, 1=To a small extent, 2=To a moderate extent, 3=To a great extent)
W2MNOBS*	TFS 18f/8f	How frequently did your master or mentor teacher observe your teaching during the 2007-08 school year? (3=At least once a week, 2=Once or twice a month, 1=A few times a year, 0=Never)
W2MNSUB	TFS 18c/8c	Has your master or mentor teacher ever instructed students in the same subject area(s) as yours? (1=Yes, 0=No)
W2MNTYN	TFS 18a/8a	Last school year (2007-08), were you assigned a master or mentor teacher by your school or school district? (1=Yes, 0=No)
W2FCSTS	NCES created	Former=1 or Current=2 status in year 2 (2008-09)
W2STTUS	NCES created	3-way teacher status in year 2 (2008-09) (1=Leavers, 2=Stayers, 3=Movers)
W3FCSTS	NCES created	Former=1 or Current=2 status in year 3 (2009-10)
W3STTUS	NCES created	4-way teacher status in year 3 (2009-10) (1=Leavers, 2=Stayers, 3=Movers, 4=Returners)
INDUCT	CREATED	Level of induction (combinations of W1T0221-226) (4=Yes to all six, 3=Yes to (2,3,5,6 - Lit Review), 2=Yes to (3,5,6), 1=Yes to (3&5), 0=No to all)

INDUCT2	CREATED	Induction that included Seminars & Supportive Administrators - (W1T0223 & W1T0225) (1=Yes to (3 & 5), 0=No to both)
MNGRASUB	CREATED	Mentor in both grade and/or subject (combinations of W2MNGRA & W2MNSUB) (3=Both, 2=Subject only, 1=Grade only, 0=Neither)
MENTIMP	CREATED	Collapses W2MNIMP from 4 categories into 2 (1=HIGH, 0=LOW)
MENTIND	CREATED	Mentoring & Induction (combinations of W1T0220 & W2MNTYN) (3=Both, 2=Induction only, 1=Mentoring only, 0=Neither)

WEIGHTING VARIABLES

W2RAFWT	weighting variable for wave 2 variables (includes retrospective cases)
W3AFWT	weighting variable for wave 3 variables